UNIVERSIDADE DE SÃO PAULO
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The Metamorphism of Mafic Rocks: Studies on Reaction Textures, Local Equilibrium and Thermodynamic Modelling

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Orientador: Prof. Dr. Renato de Moraes

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Tese de Doutorado

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There is this farmer, and he has these chickens, but they won't lay any eggs, so he calls a physicist to help. The physicist then does some calculations, and he says: "I have a solution, but it only works for spherical chickens in a vacuum".

Leonard Hofstadter
The Big Bang Theory, Season 1, Episode 9: The Cooper-Hofstadter Polarization

So far as the theories of mathematics are about reality, they are not certain;
so far as they are certain, they are not about reality

Albert Einstein

ABSTRACT

Despite the fact that metamafic rocks form one of the best studied groups of metamorphic rocks, there are still aspects of their metamorphism that are not well understood. Traditionally, studies in metamorphic petrology assume that, at peak conditions, rocks attained chemical equilibrium at a scale comparable with a thin section or hand-sample, but this may not be the case when there is little access of fluid or melt. Another important aspect is the ability of petrologists to model metamorphic processes, which depends critically on information such as thermodynamic data of relevant mineral phases. In this thesis, these different aspects of metamorphism are accessed along four separate contributions. First, the most recent set of activity-composition models available for mafic rocks is evaluated through a series of pseudosections for rocks for which there are independent thermobarometric data. The comparison between the phase diagrams and the independent data shows that, although successful some cases, these activity-composition models are not suitable to rocks predicted to be unsaturated in SiO_2, as, in these cases, the stability fields of diopside and hornblende are overestimated; additionally the stability field of garnet is underestimatedin all cases. In the second contribution, a suite of metagabbros from Mantiqueira Complex (SE Brazil), with different degrees of hydration/reequilibration, are analyzed using petrography, mineral chemistry and thermodynamic modelling. Thermodynamic modelling shows that the presence of garnet in partially reequilibrated rocks is linked to low quantities of H_2O, showing its importance as a system component, in addition to its kinetic role. On the other hand, features such as mineral zoning and pseudomorphic replacements are linked to the relative mobility of the different cations, specially the low mobility of Al. Even the most hydrated samples still show inherited local equilibrium features. The third and fourth contributions deal with the retroeclogites of São Sebastião do Paraíso (SE Brazil): in the third, through a combination of thermodynamic modelling and Zr-in-rutile and Ti-in-quartz thermobarometers, the *P*-*T* path of these rocks is constrained to a maximum *T* of ≈730 °C and maximum *P* between ≈16 and ≈19 kbar, along a clockwise path. The conditions are compatible with a collisional tectonic setting. In the fourth contribution the textural and mineralogical evolution of the retroeglogites is investigated through petrography, mineral chemistry and thermodynamic modelling. From the least to the most hydrated/reequilibrated rocks, reaction textures become diffuse and mineral compositions tend to converge towards predicted compositions, although not actually reaching them, what can be ascribed to the persistence of inherited features, such as the presence of garnet. As in the second contribution, the low mobility of Al is one of the

controlling factors in texture development, along with the high mobility of Na. The picture of metamorphism of mafic rocks that emerge from this work is one of an irregular process, where local equilibrium features perisist even after full hydration. Moreover, there are issues with the data used to model metamorphic processes. Nonetheless, if thermodynamic modelling is used cautiously and in combination with other methods, meaningful results can be obtained.

RESUMO

Apesar do fato de que as rochas metamáficas são um dos grupos de rochas mais bem estudados, ainda existem aspectos do seu metamorfismo que não são completamente entendidos. Tradicionalmente, estudos em petrologia metamórfica assumem que, no pico metamórfico, as rochas atigiram o equilíbrio químico, numa escala comparável a uma seção delgada ou amostra de mão, mas esse pode não ser o caso quando não há acesso de fuido ou de fundido. Outro aspecto importante do metamorfismo é a habilidade dos petrólogos de modelar os processos metamórficos, a qual depende criticamente de informações tais como dados termodinâmicos das fases minerais relevantes. Nessa tese, esses diferentes aspectos do metamorfismo são abordados em quatro diferentes contribuições. Primeiro, o mais recente conjunto de modelos de atividade-composição disponíveis para rochas máficas é avaliado através de uma série de pseudosseções para rochas para as quais existem dados termobarométricos independentes. A comparação entre os diagramas de fase e os dados independentes mostra que, apesar de terem sucesso em alguns casos, os modelos de atividade-composição não são adequados para rochas que de acordo com o modelamento termodinâmico, serão insaturadas em SiO_2, pois, nesses casos, os campos de estabilidade clinopiroxênio e hornblenda são superestimados; adicionalmente o campo de estabilidade da granada é subestimado em todos os casos. Na segunda contribuição, uma suíte de metagabros do Complexo Mantiqueira (SE Brasil), com diferentes graus de hidratação/reequilíbrio, são analisados através de petrografia, química mineral, e modelamento termodinâmico. O modelamento mostra que a presença de granada em rochas parcialmente reequilibradas está ligada a baixas quantidades de H_2O, mostrando sua importância como um componente, além do seu papel cinético. Por outro lado, características tais como zonamentos minerais e pseudomorfismo estão ligados às mobilidades relativas dos diferentes cátions, especialmente a baixa mobilidade do Al. Mesmo as amostras mais hidratadas exibem feições de equilíbrio local herdadas. A terceira e a quarta contribuições tratam dos retroeclogitos de São Sebastião do Paraíso (SE Brasil): na primeira, através de uma combinação de modelamento termodinâmico com os termobarômetros Zr-em-rutilo e Ti-em-quartzo, a trajetória *P-T* dessas rochas foi restrita a uma temperatura máxima de ≈730 °C e pressão máxima entre ≈16 e ≈19 kbar numa trajetória horária. As condições são compatíveis com um cenário colisional. Na quarta contribuição é investigada a evolução textural e mineralógica dos retroeclogitos, através de petrografia, química mineral e modelamento termodinâmico. Das rochas menos hidratadas/reequilibradas para as mais hidratadas/reequilibradas as texturas de reação se

tornam mais difusas e composições minerais tendem a convergir para as composições previstas, apesar de nunca de fato atingi-las, o que pode ser atribuído à persistência de feições herdadas, tais como a presença de granada. Tal como na segunda contribuição, a baixa mobilidade do Al é um dos fatores que controlam a evolução textural, juntamente com a alta mobilidade do Na. O quadro do metamorfismo de rochas máficas que emerge desse trabalho é o de um processo irregular, no qual feições de equilíbrio local persistem mesmo após completa hidratação. Além disso, há problemas com os dados usados para modelar os processos metamórficos. Não obstante, se o modelamento termodinâmico é utilizado de forma cautelosa e combinado com outros métodos, resultados significativos podem ser obtidos.

SUMMARY

1 PREAMBLE

1.1 Presentation

The main body of this doctoral thesis is composed of four chapters presented in article format, following the format of other theses recently presented at the Post-Graduation Program in Mineralogy and Petrology of the Institute of Geosciences-University of São Paulo (*e.g.* Bustamante Londoño, 2016; Salazar-Mora, 2017). These chapters are linked by the common theme of the metamorphism of mafic rocks. In accordance with their structure, each chapter has independent sections such as introduction, conclusions, references and so on. Besides the main body, this thesis also includes a general introduction, a general materials and methods section (below), a general conclusions section and a general reference list (chapter 6). Figures and tables are numbered separately in each chapter, instead of sequentially, *e.g.* the third figure of chapter 3 is numbered Figure 3.3, instead of Figure 11.

Chapter 2 of the thesis deals with the thermodynamic modelling of the metamorphism of mafic rocks, by comparing results obtained using the software THERMOCALC and the activity-composition models published by Green *et al.* (2016) and White *et al.* (2014a) with independent data. This work is currently under review, after being submitted to Lithos. When mentioned in other parts of the thesis, it will be referenced as "Santos *et al.*, submitted-chapter 2, this volume".

Chapter 3 corresponds to a work on partially equilibrated metagabbros from the Mantiqueira Complex, SE Brazil. It is currently under review after being submitted to the Journal of Metamorphic Geology. When mentioned in other parts of the thesis, it will be referenced as "Santos *et al.*, submitted-chapter 3, this volume".

Chapters 4 and 5 form a duology about the retroeclogites from São Sebastião do Paraíso, Minas Gerais (SE Brazil). Chapter 4 aims at constraining the *P-T* path followed by the retroeclogites, and, when mentioned in other parts of the thesis, it will be referenced as "Santos *et al.*, in preparation-chapter 4, this volume". On the other hand, chapter 5 is a study on the textural and mineralogical evolution of the retroeclogites. When mentioned in other parts of the thesis, it will be referenced as "Santos *et al.*, in preparation-chapter 5, this volume".

1.2 Introduction

The mafic rocks are one of the best studied groups in metamorphic petrology. Early researchers have long recognized that changes in mineral assemblage, mode and mineral composition in mafic rocks are good monitors of changes in *P* and *T* (*e. g.* Wiseman, 1934; Raase, 1974; Laird, 1980; Spear, 1981; Apted & Liou, 1983) leading to mafic rocks being the basis of the metamorphic facies scheme devised by Eskola (1939). However, these relationships are not as simple and direct as one would desire, and complications arise as consequences of several factors.

Studies in metamorphic petrology have traditionally followed an equilibrium approach to metamorphism, *i.e.*, it is assumed that the rock approached chemical equilibrium at some point of its *P-T* trajectory, at a length scale comparable to a hand-sample or thin section (Powell *et al.*, 2005; White *et al.*, 2008). To which extent such assumption will be valid depends mainly on fluid accesss (Austrheim, 1987; Guiraud, *et al*, 2001) and deformation (Goergen *et al.*, 2008; Williams & Jercinovic, 2012). Rocks with prevalence of reaction textures can be seen as situations where equilibrium at this scale was certainly not attained, while "texturally" equilibrated rocks could represent the reverse, but several studies have shown this to be an approximation even in those cases (Carlson *et al.*, 2015; Lanari & Engi, 2017; Lanari & Duesterhoeft, in press). Regarding rocks that present reaction textures, their study can prove to be useful, for example, to unravel processes that operate in different metamorphic situations (*e.g.* Carmichael, 1969; White *et al.*, 2008; Schorn & Diener, 2017) and parts of the *P-T* paths followed by rocks (*e.g.* Moraes *et al.*, 2002, Baldwin *et al.*, 2007).

Another critical aspect of metamorphic petrology is our own ability to measure and model metamorphism, even in the ideal situation where rocks attained equilibrium at a relatively large length scale. Presently, the most common approach is thermodynamic modelling, specifically *forward* modelling, *i.e.* the prediction of the equilibrium assemblages and compositions along a given *P-T* spectrum. This type of modelling is usually presented in the form of assemblage stability diagrams, also called pseudosections (Powell *et al.*, 1998; de Capitani & Petrakakis, 2010). Despite being widely used, this approach has seldom been evaluated (*e.g.* Tibaldi *et al.*, 2011; Forshaw *et al.*, in press).

Thermodynamic modelling depends on the choice of software/algorithm to perform the calculations, the thermodynamic descriptions of the phases (*e.g.* molar volumes, entropies and enthalpies of formation, and so on) and on the activity-composition models for phases that show solid solution. Despite the differences in the main software available to the community (*e.g.* Theriak, de Capitani & Brown, 1987; THERMOCALC, Powell & Holland, 1988; PerpleX, Connolly, 1990) the critical data are the thermodynamic descriptions, which are usually taken from *internally consistent thermodynamic datasets* such as Berman (1988) and Holland & Powell (1998, 2011), and the activity-composition models (Ganguly, 2001; Holland & Powell, 2003; White *et al.*, 2014a). Of these, the activity-composition models are those whose accuracy is harder to evaluate, thus the data most poorly constrained and more prone to cause problems in work that rely on them.

Another strategy to estimate pressures and temperatures of formation of metamorphic rocks involves measuring the quantities of specific trace-elements on selected phases, the most used ones being Zr-in-rutile (Zack *et al.*, 2004, Tomkins *et al.*, 2007), Ti-in-zircon (Watson *et al.*, 2006; Ferry & Watson, 2007) and Ti-in-quartz (Thomas *et al.*, 2010). By dealing with elements heavily concentrated in one phase, these thermobarometers can, in principle, "bypass" the pitfalls of working with complex systems and multiple activity-composition models, and, despite having caveats of their own (for a review, see Cruz-Uribe *et al.*, 2018), are important tools, that can be used together with the method cited above (*e.g.* Tedeschi *et al.*, 2017; Tual *et al.*, 2018).

In this thesis, all these different aspects of the metamorphism of mafic rocks will be treated, with the objective of contributing to our understanding of metamorphic reactions and processes, texture development and processes related to them, and, on the other hand, to our ability to use thermodynamics to model and measure metamorphism.

1.3 Materials and Methods

1.3.1 Petrography

Thin sections were primarily analyzed on common polarizing microscopes, using classic techniques. These observations were supplemented by back-scattered electron images obtained with a JEOL JXA-FE-8530 equipment at the Electron Microprobe Laboratory of the NAP Geoanalítica - Institute of Geosciences/University of São Paulo; with a JEOL JXA-8230 Superprobe at the Electron Microprobe Laboratory of the Institute of Geosciences and Exact Sciences/São Paulo State University (Rio Claro) and at the Electron Microprobe Laboratory of the Institute of Geosciences/University of Mainz, using a JEOL JXA-8900. In all images and phase diagrams mineral abbreviations follow Holland & Powell (2011).

1.3.2 Whole-rock chemical analysis

Whole-rock chemical analyses were obtained by X-ray fluorescence in the X-ray Fluorescence Laboratory of the NAP Geoanalítica - Institute of Geosciences/University of São Paulo, using a PANalytical AXIOS MAX spectrometer. Samples were prepared following Mori *et al.* (1999): Pressed powder pellets were prepared for analyses of minor elements, while fused glass discs were used for analyses of major elements.

1.3.3 Mineral chemistry

Mineral chemistry data was obtained in same laboratories/equipments listed on item 1.3.1, using a variety of natural and synthetic materials as standards. Typical analysis parameters were 15 kV acceleration voltage and 20 nA probe current, with probe diameter of 5 µm.

Structural formulae were calculated using spreadsheets written by the author using the software Microsoft Excel. For ilmenite, hematite, garnet and clinopyroxene, the Fe^{3+} content was estimated using the method described by Droop (1987), while for amphibole this was done using the Schumacher method (described in Leake *et al.*, 1997). No attempt was made to estimate the $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ ratios of biotite and epidote.

In addition to the point analysis, WDS compositional maps were also obtained for most major elements in several samples, in the Electron Microprobe Laboratory of the NAP Geoanalítica - Institute of Geosciences/University of São Paulo and in the Electron Microprobe Laboratory of the Institute of Geosciences and Exact Sciences/São Paulo State University (Rio Claro), using the same equipments cited above. Most of the images were processed using the software ImageJ (Schindelin *et al.*, 2012; Rueden *et al.*, 2017), while for a specific set (in chapter 4) processing was performed using XMapTools version 2.4.3 (Lanari *et al.*, 2014).

1.3.4 Thermodynamic modelling

Thermodynamic modelling, in the form of the construction of phase assemblage diagrams, or pseudosections, was performed using version 3.4.5 of THERMOCALC (Powell & Holland, 1988), dataset 6.2 (Holland & Powell, 2011, created February 6th, 2012) and the activity-composition models presented by Green *et al.* (2016), White *et al.* (2014a) and references therein. Most diagrams had *P* and *T* as axes, but some used composition variables as axes. Parameters such as H_2O content and $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ ratio were treated differently in each case.

1.3.5 Trace-element thermobarometry

Two trace-element thermobarometers were applied: Ti-in-quartz and Zr-in-rutile. Ti contents in quartz were analyzed by LA-ICP-MS, using an Agilent 8800 triple quadrupole ICP-MS at the Microgeochemistry Laboratory, Department of Earth Sciences-University of Gothenburg, Sweden; and using a Thermo Fisher Scientific iCAP Q ICP-MS at the ICP Laboratory of the NAP Geonalítica – Institute of Geosciences/University of São Paulo. In order to retrieve thermobarometric information, the calibration of Thomas *et al.* (2010) was used.

Zr contents in rutile were also analyzed at the Microgeochemistry Laboratory, Department of Earth Sciences-University of Gothenburg, using the same equipment cited above. Zr contents were used as a thermobarometer through the calibration of Tomkins *et al.* (2007).

2 A COMPARISON BETWEEN PSEUDOSECTIONS FOR METAMAFIC ROCKS USING THERMOCALC AND EXPERIMENTAL AND INDEPENDENT THERMOBAROMETRIC DATA.

Article submitted to Lithos with Caio A. Santos, Renato Moraes and Gergely A. J. Szabó as authors. Currently under review.

Abstract: The use of pseudosections has become widespread in recent years, but few studies tested them. This work aims at comparing pseudosections calculated for mafic compositions with experimental data, and with thermobarometric data obtained for correlate metapelites. Pseudosections were calculated for six mafic bulk-rock compositions, in the range 425-700 °C and 2-8 kbar. The resulting diagrams can be divided into two groups: one in which a classic sequence of mineral assemblages is predicted and another where quartz is unstable and diopside is stable throughout. The pseudosection results compare well to the independent data in three of the six studied cases. The main inconsistencies found in the pseudosections are underestimation of the stability field of garnet and overestimation of the stability field of diopside, which is at odds not only with data specific to the rocks studied here, but with the literature on metamafic rocks in general. In the case of garnet, the most likely cause of discrepancy is the absence of Mn in the activity-composition models available. On the other hand, the issue with diopside is much harder to evaluate, as it may be related to any of the activity-composition models, or to relationships between two or more of them. Nonetheless, we can affirm that the overestimation of the diopside stability field occurs in rocks calculated to be unsaturated in SiO_2, and that it is linked to a minor overestimation of the stability field of hornblende.

Key words: pseudosection; mafic rocks; THERMOCALC; evaluation.

2.1 Introduction

Mineral assemblage stability diagrams, widely known as pseudosections, are phase diagrams calculated for a specific bulk-rock composition, or range of compositions. In relation to P-T projections, or petrogenetic grids, they have the advantage of only presenting equilibria relevant to this given bulk-rock composition, which makes pseudosections much easier to read and interpret. The use of this kind of diagram has become widespread in Metamorphic Petrology since the 1990s (Connolly & Petrini, 2002; Powell, *et al.*, 1998).

Despite the intense calculation of these diagrams, with the exception of the works that describe the software, thermodynamic datasets and activity-composition models used for pseudosection calculations, there are few papers that either critically analyze pseudosection output or compare their results with the ones given by other methods (but see Grant, 2009; Tibaldi *et al.*, 2011; White *et al.*, 2011, Forshaw *et al.*, in press).

In the present work, the approach is to compare pseudosection output with experimental results and with thermobarometric calculations obtained for metapelites that were metamorphosed under the same conditions as the modelled metamafic rocks. Comparison with experiments has an evident value, as P and T, variables that one usually wants to determine with pseudosections, are very well established. On the other hand, in the conditions analyzed here, greenschist and amphibolites facies, metapelites are characterized by low-variance assemblages (Spear, 1993; Bucher & Grapes, 2011, and references therein) and the thermodynamic properties of their constituent phases are better known, making them good standards. These data are not without problems of their own, though: experiments may not produce equilibrium assemblages, and analysis of the products can be problematic (see White *et al.*, 2011, for a specific discussion on this subject), while P-T estimates for metapelites can, despite the characteristics cited above, have the same problems as P-T estimates for mafic rocks. However, we believe that, with these uncertainties in mind, the comparison is still valid, if nothing, because there are no *absolute* standards to be invoked.

By comparing pseudosection results with independent data we are, in principle, testing the approach as whole, *i.e.* the software, thermodynamic descriptions of phases and the activity-composition models, since the results depend on it all. However, by now the methods implemented in THERMOCALC (and in other software such as PerpleX and Theriak-Domino) are, after decades of application, well established (de Capitani & Brown, 1987; Connolly & Petrini, 2002; Powell *et al.*, 1998, 2005; Powell & Holland, 2008) in a way that, if there are problems, they are much more likely to stem from the thermodynamic data. Of these, the activity-composition models are the most poorly constrained, as their accuracy cannot be directly measured, and can be accessed only by comparing the predictions made using a given model with the parageneses and mineral compositions present in nature or obtained experimentally (Powell & Holland, 2008), so, in a work such as the present one, we are evaluating the activity-composition models, more than any other thing.

2.2 Materials and Methods

2.2.1 Sample choices

Six compositions of mafic rocks were selected for modelling (Table 2.1 and Figure 2.1): two amphibolites from the Juscelândia Sequence, Goiás, Brazil, (Moraes & Fuck, 1999; Moraes *et al.*, 2003); one amphibolite from the Votuverava Group, São Paulo, Brazil (Campanha *et al.*, 2015; Faleiros *et al.*, 2011); one amphibolite from the Ivrea Zone, Northern Italy (Kunz *et al.*, 2014) and the compositions utilized in the experimental works of Spear (1981) and Apted & Liou (1983). The criteria for selecting the samples were the possibility of performing the kind of analysis we intended, what means availability of published bulk-rock composition and experimental/thermobarometric data to which the pseudosections could be compared. Additionally, we had access to samples of two of the study cases (the samples from Votuverava Group and Juscelândia Sequence). In these cases thin sections were prepared and analyzed with a petrographic microscope, while for the others the descriptions were taken from the literature along with the compositions.

Table 2.1. Chemical composition of the study samples. All values given in weight %. FeO values with a "*" are total Fe.

Sample	IZ 006	RM 201	SM 495	RM 29e	AL, 83	Sp, 81
SiO_2	54.22	45.81	46.85	51.06	50.44	49.43
TiO_2	0.85	2.23	1.40	2.97	1.79	1.62
Al_2O_3	18.16	13.66	14.92	10.39	13.37	15.97
FeO	8.04*	12.82	12.07*	13.78	11.93*	9.43*
Fe_2O_3	-	2.76	-	2.14	-	-
MnO	8.51	0.21	0.20	0.22	0.21	0.18
MgO	3.31	6.55	7.63	5.43	6.58	8.50
CaO	0.70	10.26	11.55	8.69	10.95	10.73
Na_2O	0.19	3.43	2.51	2.28	3.76	2.87
K_2O	8.51	0.62	0.21	0.42	0.19	0.18
P_2O_5	3.31	0.18	0.13	0.25	0.20	0.15
Total	97.81	98.53	97.47	97.63	99.42	99.06

2.2.2 Thermodynamic modelling

P-T pseudosections covering the range 425-700 °C and 2-8 kbar were calculated for all compositions using version 3.45 of THERMOCALC (Powell & Holland, 1988), and dataset ds62 (Holland & Powell, 2011, created February 6th, 2012). The activity-composition models used were from White *et al.* (2014a), Green *et al.* (2016) and references therein.

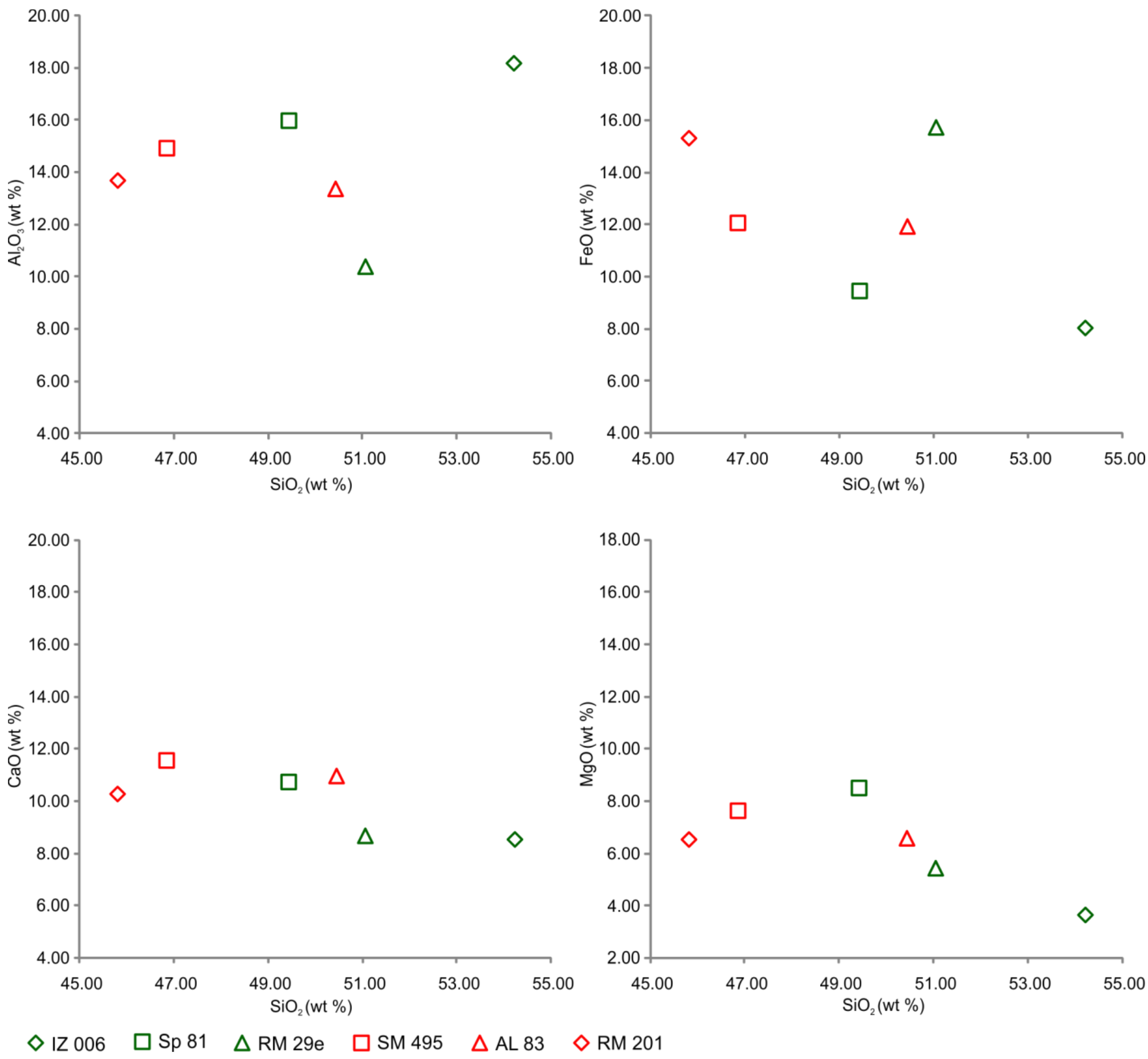

Figure 2.1. Bivariate plots comparing the chemical composition of the study samples.

Green *et al.* (2016) present two clinopyroxene activity-composition models: the "omphacite model", that takes into account order-disorder in M1 and M2 sites, thus allowing high pressure omphacite and jadeite compositions to be calculated, including coexistence between a phase rich in these end-members and diopside; and the "augite model", that does not consider order-disorder in M1 and M2 sites but allows Al into T site and Fe^{2+} and Mg into M2 site, thus allowing high temperature augite and pigeonite compositions to be calculated. At the *P*-*T* range covered here, the two models produce similar results (Green *et al.*, 2016), what is confirmed by tests performed in this work (not shown). Since for some compositions modelled here omphacite is calculated to be stable at parts of the covered *P*-*T* spectrum (see below), the “omphacite model” was used in all calculations.

2.2.3 Bulk-rock compositions

The bulk-rock compositions taken from literature were converted to mol% in order to be used with THERMOCALC (Table 2.2). The chemical model system used is NCKFMASHTO, with Mn being ignored. All P_2O_5 was considered to be stored on apatite, and the equivalent amount of CaO was removed from each composition. This assumption seems reasonable, as apatite is present in the three samples that could be analyzed petrographically, and no other phosphate was detected. Similarly, Kunz *et al.* (2014) cite apatite as one of the accessories present in the group of samples IZ 006 belongs to, and does not mention any other phosphate. No apatite is mentioned in the run products of Spear (1981) and Apted & Liou (1983), but neither are other phosphates, so, given its common occurrence in mafic rocks of these metamorphic conditions, apatite is assumed to be the P_2O_5-bearing phase.

Table 2.2. The chemical compositions actually used in the calculations with THERMOCALC. MnO and P_2O_5 have been removed (see text for details) and the compositions were converted to mol%. In the cases where FeO and Fe_2O_3 have been reported separately, Fe was recalculated to be all FeO, as THERMOCALC handles $X_{Fe^{3+}}$ by adding an O component (see Diener & Powell, 2010) whose assumed value for each sample is given in this table. The O entry for sample AL 83 shows two values because two pseudosections (with different $X_{Fe^{3+}}$ values) were calculated. See below for details about $X_{Fe^{3+}}$ values assumed for each sample. Values do not need to sum 100%, as THERMOCALC performs the normalization automatically.

Sample	IZ 006	RM 201	SM 495	RM 29e	AL, 83	Sp, 81
SiO_2	59.70	49.2	50.2	55.00	53.30	51.90
TiO_2	0.70	1.80	1.10	2.40	1.40	1.30
Al_2O_3	11.80	8.60	9.40	6.60	8.30	9.90
FeO	7.40	13.70	10.80	14.20	10.50	8.30
MgO	6.00	10.50	12.20	8.70	10.40	13.30
CaO	10.00	11.70	13.20	9.90	12.20	12.00
Na_2O	3.50	3.60	2.60	2.40	3.90	2.90
K_2O	0.50	0.40	0.10	0.30	0.10	0.10
O	0.74	1.10	1.10	0.80	0.60/1.21*	0.50

In all calculations H_2O is considered to be a phase in excess. Since this leads to unrealistic melt proportions (*e.g.* Droop & Brodie, 2012; Weinberg & Hasalova, 2015), no melt bearing equilibria were calculated, except for the *solidus* curve.

Regarding the $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ ratio, therefore denoted as $X_{Fe^{3+}}$, the compositions used in experiments and the compositions intended to be compared to data from natural samples represent different situations: experiments, as discussed by Diener & Powell (2010), are carried out under fixed a_{O_2}, while in nature a fixed redox budget, or amount of oxygen, is more likely, and this is the condition usually assumed in calculations using THERMOCALC. Following the cited authors, in the case of pseudosections intended to be compared to experimental work, the chemical potential of oxygen, μ_O, was calculated simultaneously with the phase diagram calculations, via calcmuo script, and the values obtained were compared to the P-T-μ_O diagrams for buffering assemblages presented by Diener & Powell (2010), in order to define the $X_{Fe^{3+}}$ value that should be used. Obviously, since the calculated μ_O varies along the covered P-T range, this is not an exact approach, but it makes for a reasonable approximation.

On the other hand, the compositions intended to be compared with data from natural rocks pose the same challenge faced by regular studies using pseudosections, in that there is no reliable way to quantify the $X_{Fe^{3+}}$ during the metamorphic processes (White *et al*., 2000; Diener & Powell, 2010). For two of the compositions used here only total Fe was reported. In these cases $X_{Fe^{3+}}$ was set to 0.2, close to the mean value given for MORBs by Lecuyer & Ricard (1999), and, additionally, the effects of varying the ratio were investigated using P-X_{Fe3+} pseudosections covering values of $X_{Fe^{3+}}$ between 0.0 and 0.3. For the other two samples bulk-rock Fe_2O_3 contents were reported. As discussed by Diener & Powell (2010) bulk-rock analysis are likely to overestimate (to some unknown extent) the Fe^{3+} content, due to weathering and to oxidation during sample preparation. As these analysis returned $X_{Fe^{3+}}$ values already below those used for the other two samples, the values were only rounded down to 0.12 and 0.16.

2.3 Modelled Rocks

2.3.1 Sample IZ 006 - Ivrea Zone

Kunz *et al.* (2014) gives a general description of the “mid-amphibolite facies” mafic rocks from Ivrea as being weekly foliated rocks composed of hornblende, plagioclase, quartz and biotite. The presence of accessory ilmenite and the absence of garnet are recorded in a table (their table 1) that lists the mineral assemblages of each sample.

The Ivrea Zone, in northern Italy, represents a part of the pre-Alpine basement of the southern Alps, composed by the Mafic Complex, which corresponds to layered mafic-ultramafic rocks, and by the Kinzingite Formation, which corresponds to metapelitic gneiss with mafic rock intercalations, also containing minor marble and calc-silicate rocks (Sinigoi *et* *al.*, 2011; Henk *et al.*, 1997; Barboza & Bergantz, 2000; Kunz *et al.*, 2014). It is bordered, to the north, by the Insubric Line, which separates the Ivrea Zone from the Alpine units, and to the south by the Cossato-Mergozzo-Brissago Line (CMB Line), which separates it from the Strona-Ceneri Zone, composed by lower-grade metasedimentary and metamafic rocks and intrusive granites (Schmid *et al.*, 1987; Boriani *et al.*, 1990; Henk *et al.*, 1997; Handy *et al.*, 1999). The sample whose composition was used in this study is an amphibolite from the Kinzingite Formation.

The metamorphism in the Ivrea Zone varies between mid-amphibolite and granulite facies, as had been shown in numerous studies (*e.g.* Henk *et al.*, 1997; Luvizotto & Zack, 2009; Redler *et al.*, 2012, among others).

2.3.2 Samples RM 29e and RM 201 - Juscelândia Sequence

Sample RM29e is a fine-grained amphibolite with nematoblastic texture, composed of hornblende and plagioclase. Accessory phases include ilmenite, fine-grained garnet and rare apatite and interstitial carbonate. Sample RM 201 is a medium-grained amphibolite composed of hornblende and plagioclase. Accessory phases include sphene, ilmenite and rare apatite.

The Juscelândia Sequence is a metavolcanosedimentary sequence associated to the Barro Alto Mafic-Ultramafic Complex (Moraes & Fuck, 1999; Moraes *et al.*, 2003). These units occur in the central portion of the Brasilia Fold Belt, a large domain formed and metamophosed during the neoproterozoic Brasiliano/Pan-African Orogenic Cycle (Dardenne, 2000; Pimentel, 2016; Valeriano *et al.*, 2004a). The Juscelândia Sequence is formed by (garnet-) amphibolite, biotite gneiss, metapelites and metachert (Moraes & Fuck, 1999; Moraes *et al.*, 2003). *P-T* conditions of metamorphism were calculated using multi-equilibrium thermobarometry with THERMOCALC. These calculations were based on a metapelite interbedded with the mafics studied here (samples RM 201 and RM 29e), which is composed of garnet, staurolite, sillimanite, biotite, quartz, muscovite and plagioclase, and yielded 600 °C and 5.5 kbar (Moraes & Fuck, 1999).

2.3.3 Sample SM 495 - Votuverava Group

Sample SM 495 is medium-grained nematoblastic amphibolite composed of prismatic to acicular hornblende and polygonal plagioclase. Hornblende can very rarely display light colored nuclei, and plagioclase can also be chemically zoned. Sphene is a common accessory mineral, and epidote is rare. For a metapelite sample from the same unit and geographically near, Yogi (2016) determined the conditions of formation as 620-650 °C at 6.0-7.0 kbar, using pseudosections calculated with Perplex, multi-equilibrium calculations with THERMOCALC and the GASP barometer (Hogdes & Crowley, 1985). The bulk-rock-composition used in her pseudosection is presented in Table 2.3.

The Votuverava Group is part of the southern segment of the Ribeira Fold Belt, which was formed during the neoproterozoic Brasiliano/Pan-African Orogenic Cycle, and is composed by tectono-stratigraphic terranes of different origins separated by shear zones (Heilbron *et al.*, 2004; Campanha *et al.*, 2015). The Votuverava Group is part of the Apiaí Terrane, and is composed mainly by metapelites, associated with metamafic rocks and minor quartzite, calc-silicate rocks and marble. The rocks of the Votuverava Group were metamorphosed under conditions varying from 380 to 630 °C and 6 to 8 kbar, along a barrovian-regime *P-T* path (Campanha *et al.*, 2015; Faleiros *et al.*, 2007, 2010, 2011).

2.3.4 Sample V25 RDI T2, Juan de Fuca Ridge

This sample is an olivine tholeiite dragged from the Juan de Fuca Ridge. It is composed of olivine phenocrysts in a groundmass of plagioclase, clinopyroxene and ilmenite. It served as starting material for the experiments performed by Spear (1981). The composition and description were taken from this work. For sake of simplicity, this sample will thereafter be referred to as "Sp 81".

2.3.5 Basalt glass, Juan de Fuca Ridge

This is a basalt glass sample from the Juan de Fuca Ridge and served as starting material for the experimental work of Apted & Liou (1983), from where the composition was taken. This sample will thereafter be referred to as "AL 83".

2.4 General Features of Pseudosections for Mafic Compositions Calculated With THERMOCALC

The calculated pseudosections can be divided in two groups: the first, including samples IZ 006, Sp 81 and RM 29e (Figures 2.2a-b, 2.3a), displays sequences of mineral assemblages compatible with the classic metamorphic facies (Apted & Liou, 1983; Bucher & Grapes, 2011; Laird, 1980). They resemble the pseudosections presented by Diener *et al.* (2007), Diener & Powell (2012) and Green *et al.* (2016): greenschist facies conditions are

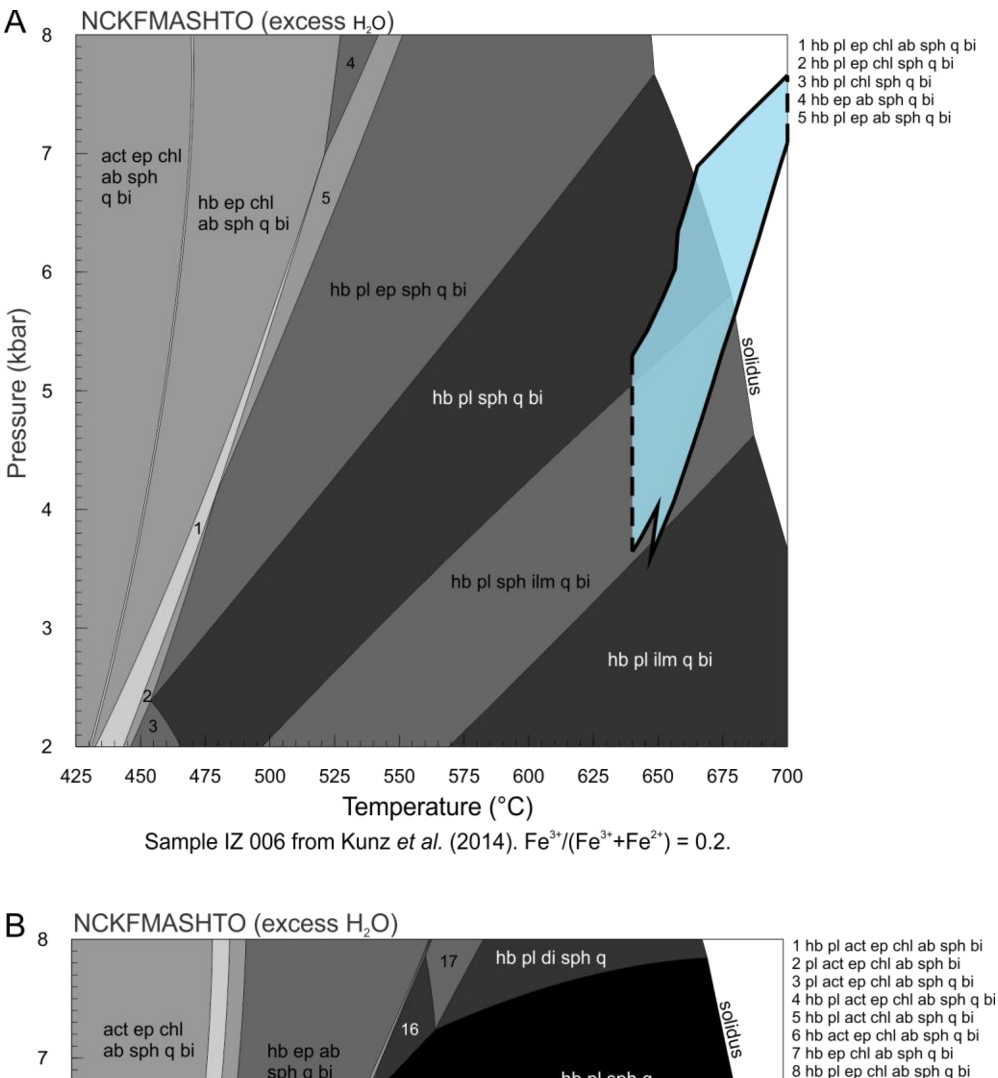

Figure 2.2. (a) *P-T* pseudosection calculated for sample IZ 006. The blue field represents the *P-T* field delimited by Redler *et al* (2012) for an associated metapelite. All mineral abbreviations follow Holland & Powell (2011). (b) *P-T* pseudosection calculated for sample Sp 81.

characterized by the mineral assemblage actinolite + epidote + chlorite + albite + sphene + quartz + biotite and, as temperature rises, actinolite, chlorite, albite and epidote are consumed, while hornblende and plagioclase are introduced, followed by diopside at middle amphibolite facies (Figures 2.2a-b, 2.3a). Under low pressure conditions plagioclase can be introduced before hornblende, and chlorite and actinolite persist to temperatures higher than those reached by epidote, while at higher pressure the reverse occurs. Albite is removed from the assemblage shortly after plagioclase appearance, except for sample Sp 81 at low pressures, where epidote is removed and albite is calculated to persist for some tens of °C after plagioclase appearance. Low pressures and high temperatures favor ilmenite over sphene. Quartz is present throughout, except for temperatures higher than 590 ºC and pressures lower than 3 kbar in sample Sp 81 (Figure 2.2b). Garnet only appears at P > 11 kbar (see below) and glaucophane appears at low temperature, and pressure higher than 7 kbar in the pseudosection calculated for sample RM29e (Figure 2.3a).

The second group includes the remaining samples: AL 83, RM 201 and SM495. The main differences between this group and the previous one are the predicted stability fields of diopside and quartz, with the first being present and the second being absent from greenschist facies conditions through most of the covered *P-T* spectrum (Figures 2.3b, 2.4a-b). Other differences include hornblende being stable down to lower temperatures than in the first group, and that the onset of blueschist facies mineral assemblages is marked by the appearance of omphacite, rather than glaucophane. The behavior of other minerals, such as actinolite, chlorite and epidote, is similar to what is observed in the first group.

Table 2.3. Chemical composition of sample TY-020 used in the pseudosection calculations by Yogy (2016). Values in weight %.

SiO_2	61.78
TiO_2	0.81
Al_2O_3	15.94
Fe_2O_3	6.84
MnO	0.29
MgO	5.19
CaO	0.46
Na_2O	0.55
K_2O	3.45
P_2O_5	0.16
Total	95.46

Although the exact pressures and temperatures vary, quartz and diopside behave very similarly in each of the pseudosections calculated for these samples(Figures 2.3b, 2.4a-b): diopside can be modally important in greenschist facies (up to 20%), then quickly decreases after hornblende appearance (running out in two of the pseudosections) and then increases gradually with *T* increase, with a quick increase after ilmenite starts to replace sphene as the Ti-bearing phase. Quartz appears at 450-500 °C and is favored by high pressures. The only noticeable compositional difference between the two groups of samples is SiO_2 content (Figure 2.1), but it does not explain the differences, as RM 29e (whose pseudosection is not diopside-bearing) is *poorer* in SiO_2 than AL 83. In fact, the key factor seems to be SiO_2 *saturation*. This is shown in a *T*-x pseudosection between the compositions of samples Sp 81 and AL 83 (Figure 2.5): in this case, at low temperatures, along a compositional traverse between the two samples, actinolite increases and chlorite decreases. Since actinolite is richer in SiO_2 than chlorite, quartz mode *decreases* along such a traverse, despite the marginal SiO_2 increase.

This pseudosection also shows that the two characteristics (absence of quartz and presence of diopside) are linked: along the compositional traverse, diopside appears shortly after quartz runs out. In fact, it can be noted in the *P-T* pseudosections that compositions that display the highest diopside modes are the ones with the smallest quartz stability fields. Furthermore, a pattern such what is predicted for SM 495, where diopside runs out after hornblende appearance and returns to the assemblage at temperatures 80-100 °C higher, is reproduced by a composition in the middle of the Sp 81-AL83 traverse, like x = 0.7, for example.

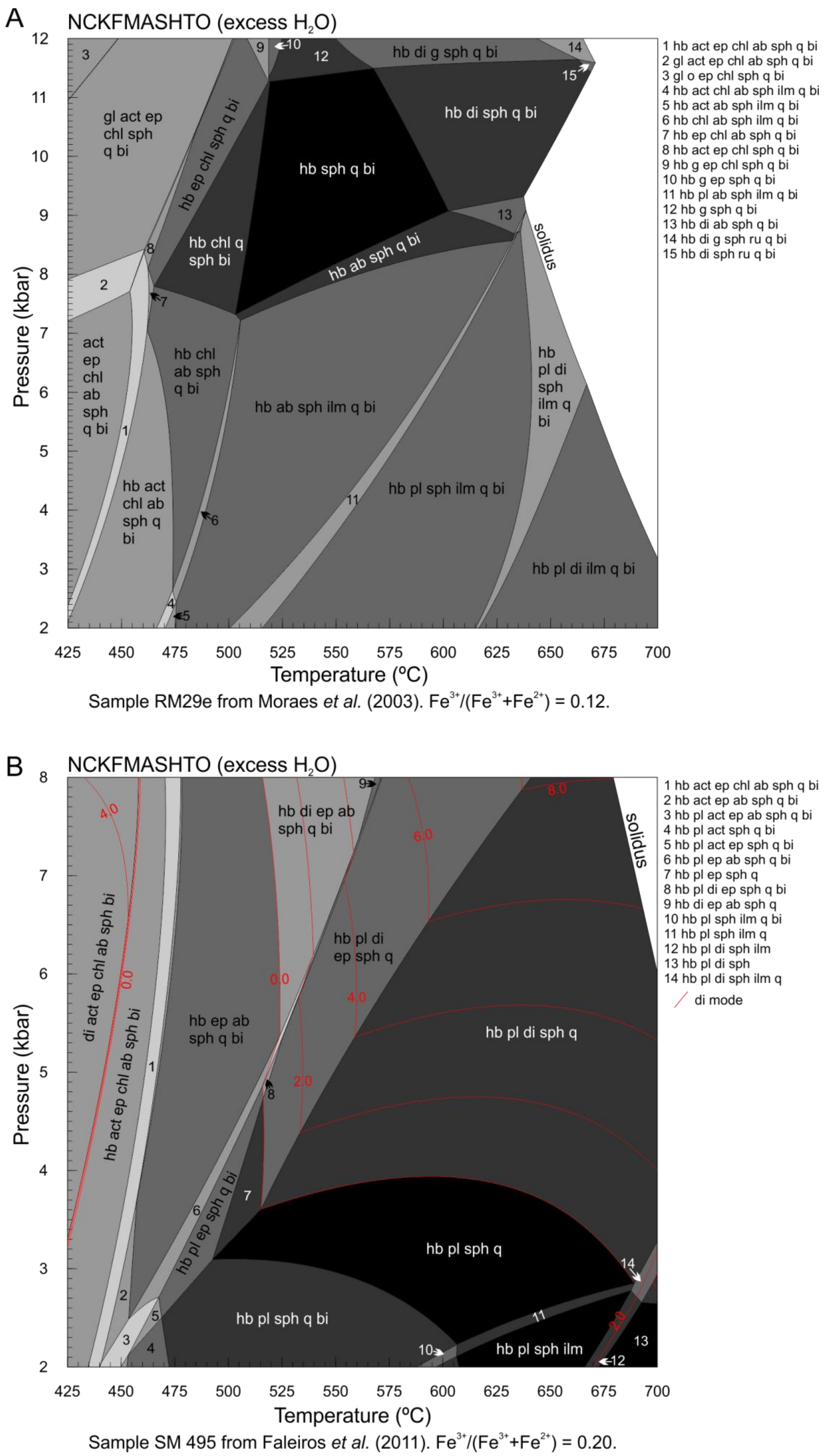

Figure 2.3. *P*-*T* pseudosections calculated for samples RM 29e (a) and SM 495 (b).

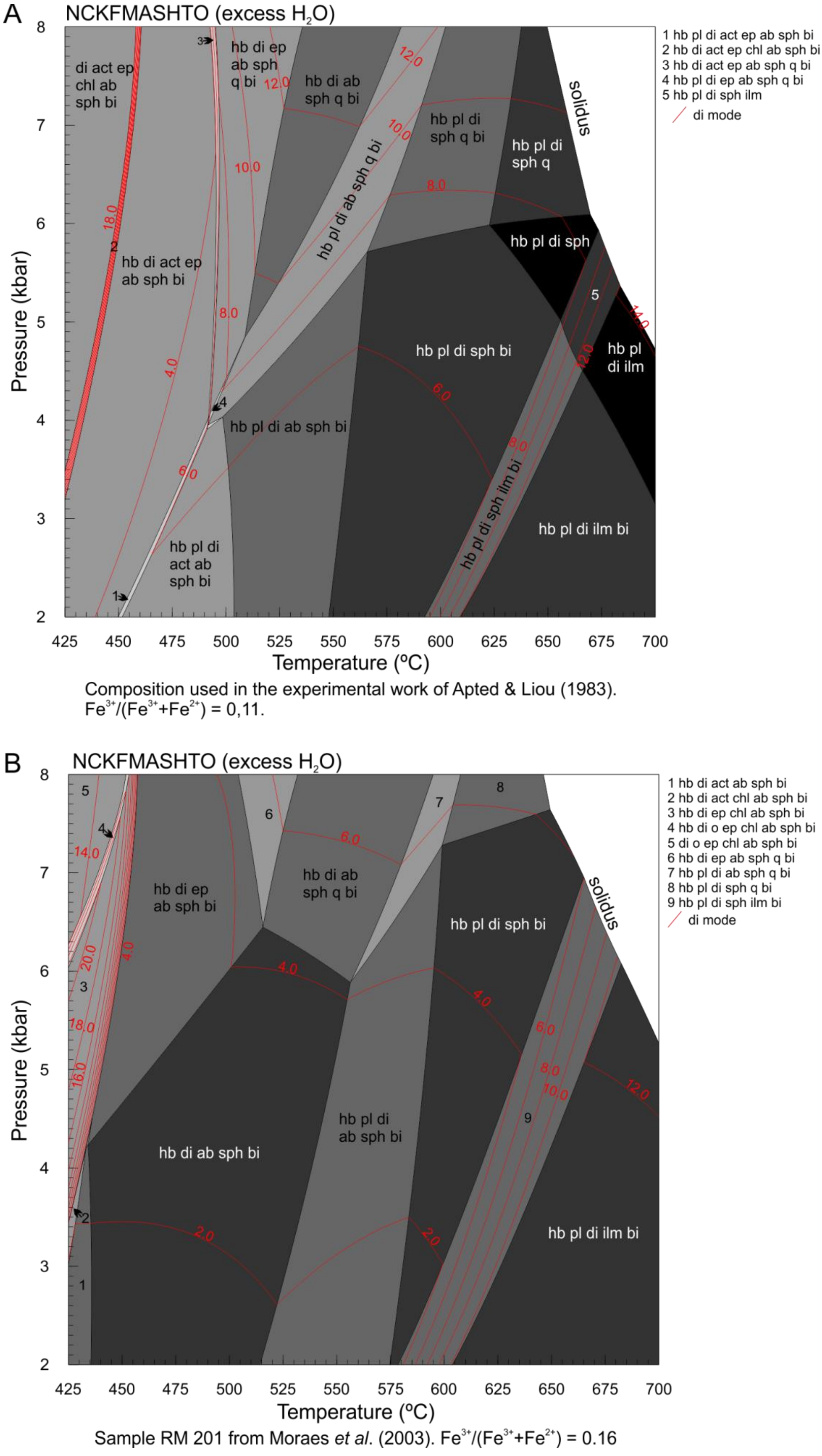

Figure 2.4. *P*-*T* pseudosections calculated for samples AL 83 (a) and RM 201 (b).

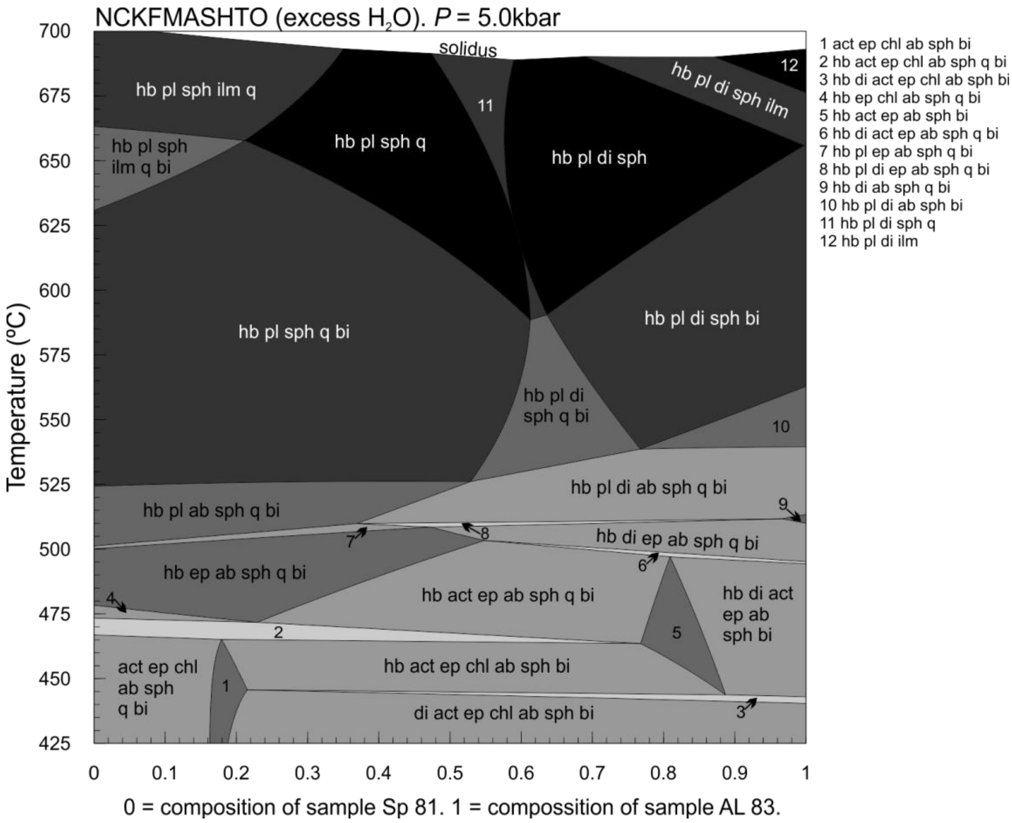

Figure 2.5. *T-x* pseudosection calculated between the compositions of the samples Sp 81 and AL 83, showing the transition between "normal" mineral assemblages and diopside-bearing assemblages. *P* = 5.0 kbar.

2.5 Comparison Between Pseudosections and the Observed Mineral Assemblages

2.5.1 Sample IZ 006

The mineral assemblage of sample IZ 006, as stated above, is hornblende + plagioclase + quartz + biotite + ilmenite. In the pseudosection, this assemblage is calculated to be stable at a rather large field, which stretches from 590 °C to more than 700 °C, and from less than 2 kbar to just over 4.5 kbar (Figure 2.2a).

We will compare our results specifically with the results obtained by Redler *et al.* (2012) for rocks from the Kinzingite Formation, because one of the metapelite samples whose composition was modelled in their work (IZ 010) is extremely close to the sample used here, as seen in the maps presented in the two works (figure 2 from Kunz *et al.*, 2014 and figure 5 from Redler *et al.*, 2012). Redler *et al.* (2012) calculated pseudosections and refined the *P-T* results using the modes of the minerals, and the resulting fields are superimposed on the pseudosection in Figure 2.2a (check their figure 10a). The temperatures calculated for the metapelites and the metamafic rocks are in good agreement, but the pressures inferred from the metamafic rock pseudosection are lower, so that the stability fields actually superimpose only in a tiny area of the diagram at approximately 650 °C and 4.7 kbar.

Figure 2.6 is a P-$X_{Fe^{3+}}$ pseudosection calculated at 655 °C and between $X_{Fe^{3+}}$ = 0.0 and $X_{Fe^{3+}}$ = 0.3. It shows that, reducing $X_{Fe^{3+}}$ has the general effect of shifting phase boundaries up pressure. The P range of the metapelite stability field, for T = 655 °C, is superimposed on the pseudosection, and it can be seen that for slightly lower $X_{Fe^{3+}}$ values, there is good agreement between the two pseudosections.

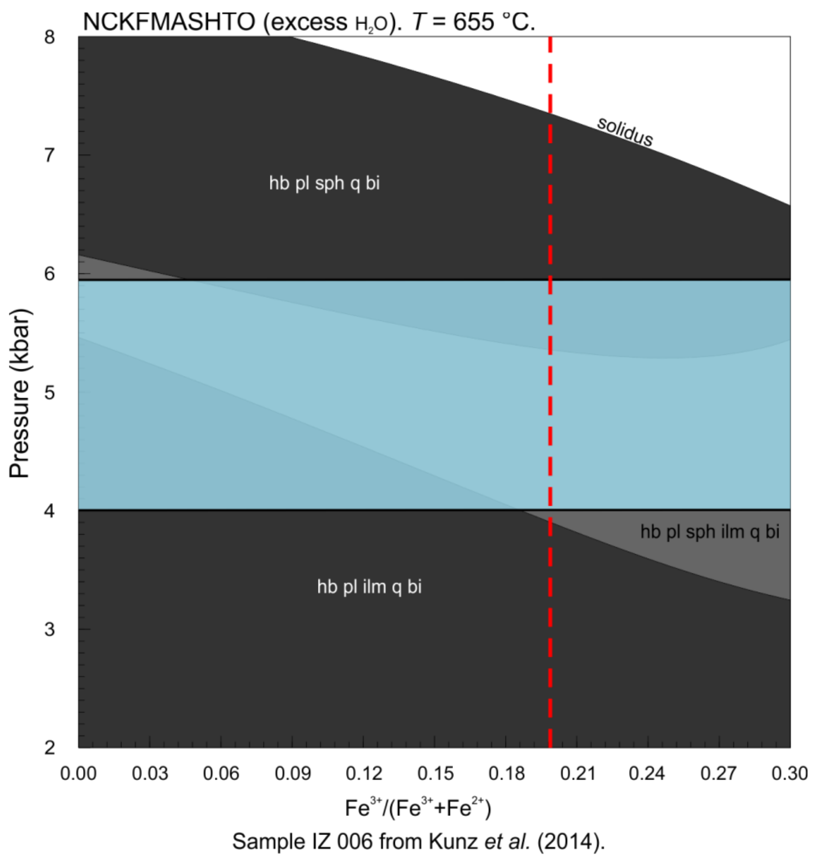

Figure 2.6. P-$X_{Fe^{3+}}$ pseudosection calculated for the composition of sample IZ 006. The blue area represents the pressure at which the rock would have equilibrated, according to the calculations performed by Redler (2012) for nearby metapelite. The red dashed line represents the $X_{Fe^{3+}}$ value assumed in the P-T pseudosection for this sample in this work (figure 2.2a). T = 655 °C.

2.5.2 Sample Sp 81

Spear (1981) performed experiments in the range 500-900 °C and 1-5 kbar, conditions that partially overlap the calculated pseudosections. The pseudosection was made to be comparable to the experiments with oxygen fugacity controlled by the quartz-fayalite-magnetite (QFM) buffer.

Nine runs overlap the conditions for which the pseudosection was calculated (Table 2.4). One characteristic of the pseudosection is that quartz and biotite are present in most fields (Figure 2.2b). Neither biotite nor quartz were identified in the experimental runs, but both phases are minor enough to be easily overlooked, or to not have nucleated. If these two phases are ignored, there is a good agreement between the experiments and the pseudosection. Only the lowest temperature run, at 498 °C/5 kbar, presents a mineral assemblage different from the calculated one, the difference being that, in the pseudosection, the mineral assemblage is hornblende + epidote + albite + sphene + quartz + biotite, transitional to greenschist facies assemblages. The lowest temperature runs are the ones most likely to not produce equilibrated mineral assemblages, due to low temperatures and difficulties to nucleate phases in those conditions.

Table 2.4. Comparison between the experimental products obtained by Spear (1981) and the assemblages predicted to be stable by pseudosection modelling for the same composition. All the runs considered had their oxygen fugacity buffered by the quartz-fayalite-magnetite buffer.

P(kbar), *T*(°C)	Assemblages	
	Experimental run	Pseudosection
3.0, 506	hb pl ilm sph	hb pl sph ilm q bi
3.0, 561	hb pl ilm sph	hb pl sph ilm q bi
3.0, 607	hb pl ilm sph	hb pl sph ilm q bi
3.0, 650	hb pl ilm	hb pl ilm q bi
3.0, 655	hb pl ilm	hb pl ilm q bi
3.0, 699	hb pl ilm	hb pl ilm
5.0, 498	hb pl ilm sph	hb ep ab sph q bi
5.0, 606	hb pl ilm sph	hb pl sph q bi
5.0, 700	hb pl ilm sph	hb pl sph ilm q

2.5.3 Sample RM 29e

Sample RM 29e presents the assemblage hornblende + plagioclase + ilmenite + garnet + quartz ± carbonate. No carbonate-bearing equilibria was calculated, but carbonate is a minor phase (< 1%), and it was simply disregarded. Assuming the conditions determined by Moraes & Fuck (1999) for metapelites in the area, at 600 °C and 5.5 kbar, as valid for this sample, the mineral assemblage, according to the pseudosection, would be hornblende + plagioclase + sphene + ilmenite + quartz + biotite (Figure 2.3a). Even ignoring biotite, the observed mineral assemblage does not agree with what is calculated in the pseudosection. One of the mismatches is the absence of garnet in the calculated assemblage, so the pseudosection for this sample was calculated for a larger *P* range, up to 12 kbar. With this range, garnet does appear, but just at P > 11 kbar, associated with sphene and diopside. The other main difference is that, in the assumed conditions, sphene is calculated to be stable alongside ilmenite. Its stability field is calculated to extend up to 650 °C, in a way that it runs out only after diopside enters the assemblage. In short, the observed assemblage is not stable anywhere in the covered *P-T* spectrum.

2.5.4 Sample SM 495

Sample SM 495 presents the mineral assemblage hornblende + plagioclase + sphene ± epidote. The calculated *P-T* conditions are 620-660 °C and 6.1-7 kbar (Yogi, 2016), and the stable mineral assemblage at these conditions, according to the pseudosection, would be hornblende + plagioclase + diopside + sphene + quartz (Figures 2.3b, 2.7a). The observed mineral assemblage is different from the calculated one, even if biotite and quartz are not considered. In Figure 2.7a, the results of Yogi (2016) are superimposed on the pseudosection, and two of the pseudosection fields are highlighted: the field of the assemblage hornblende + plagioclase + sphene + quartz and the field of the assemblage hornblende + plagioclase + epidote + sphene + quartz. The second field is a rather small one, at lower pressure and temperature, relative to Yogi (2016) estimate. The field of the epidote-absent assemblage, on the other hand, is larger, especially at the *T* axis, going from ≈500 to 675 °C, and from 2.2 to 4.0 kbar, at its largest *P* span, at ≈600 °C. It means that the temperature that would be inferred from the pseudosection agrees with the estimate made from the metapelite, while the pressure does not. The difference, in this case, is that the pseudosection predicts the presence of diopside in the amphibolite. Diopside mode is predicted to increase with pressure increase, being over 6% at 7 kbar.

Since Fe^{3+} content is not constrained in this example, we calculated a P-$X_{Fe^{3+}}$ pseudosection (Figure 2.7b) between $X_{Fe^{3+}}$ values of 0.0 and 0.3, at T = 640 °C, *i.e.* in the middle of the *T* interval defined by Yogi (2016). As in the previous examples in this work

(Figure 2.6) and in the literature (*e.g.* Diener & Powell, 2010), reducing $X_{Fe^{3+}}$ has the general effect of shifting phase boundaries up pressure. Although the observed assemblage is still not calculated to be stable at the same conditions estimated using the metapelites, at $X_{Fe^{3+}}$ = 0.09 the differences are negligible, since quartz is absent and calculated diopside mode is about 2%.

2.5.5 Sample AL 83

Apted & Liou (1983) carried out a series of experiments in the range 400-700 °C, 5-7 kbar, thus mostly overlapping the *P-T* range considered in this work (Table 2.5). Two pseudosections were calculated, one whose $X_{Fe^{3+}}$ makes it comparable to the experiments with oxygen fugacity controlled by the quartz-fayalite-magnetite (QFM) buffer (Figure 2.4a) and a second one, comparable to the experiments with oxygen fugacity controlled by the nickel-nickel oxide (NNO) buffer (Figure 2.8). Despite the fact that Apted & Liou (1983) briefly discuss the phase relations between the Ti-bearing phases, sphene and ilmenite, they are not explicitly accounted for as run products in their run table (their table 7, page 336), so the presence or absence of ilmenite and sphene will not be discussed here.

In general terms, the pseudosections for AL 83 predict typical amphibolite facies minerals, such as hornblende, plagioclase and diopside, to be stable at lower temperatures than those indicated by the experimental data (Figures 2.4a, 2.8) while experimental data indicate typical greenschist facies minerals, specially epidote and albite, to be stable at higher temperatures than those predicted in the pseudosections. Both pseudosections show diopside to be stable throughout the covered spectrum (Figures 2.4a, 2.8), while none of the runs produced it, regardless of the f_{O_2} buffer utilized. For the pressures at which the experiments were carried out both pseudosections predict hornblende to be stable at temperatures as low as 460 ºC, while in the experiments the lowest temperatures at which hornblende was produced were 600 ºC (7 kbar/QFM), 575 ºC (7 kbar/NNO) and 525 ºC (5 kbar/NNO); plagioclase is predicted in the pseudosections to be stable at temperatures higher than 530-560 ºC, while in the experiments it was produced only in the highest temperature runs, at 7 kbar/700 ºC (QFM) and 7 kbar/700 ºC and 5 kbar/650 ºC (NNO). The runs at 675 ºC (7 kbar/QFM), 700 ºC (7 kbar/QFM) and 700 ºC (5 kbar/NNO) fall in the suprasolidus field of the corresponding pseudosections, but no melt was detected in the experiments. It is worth noting that the modelled position of the solidus curve is bracketed by several experiments (see Green *et al.*, 2016), so in this regard the model is likely correct.

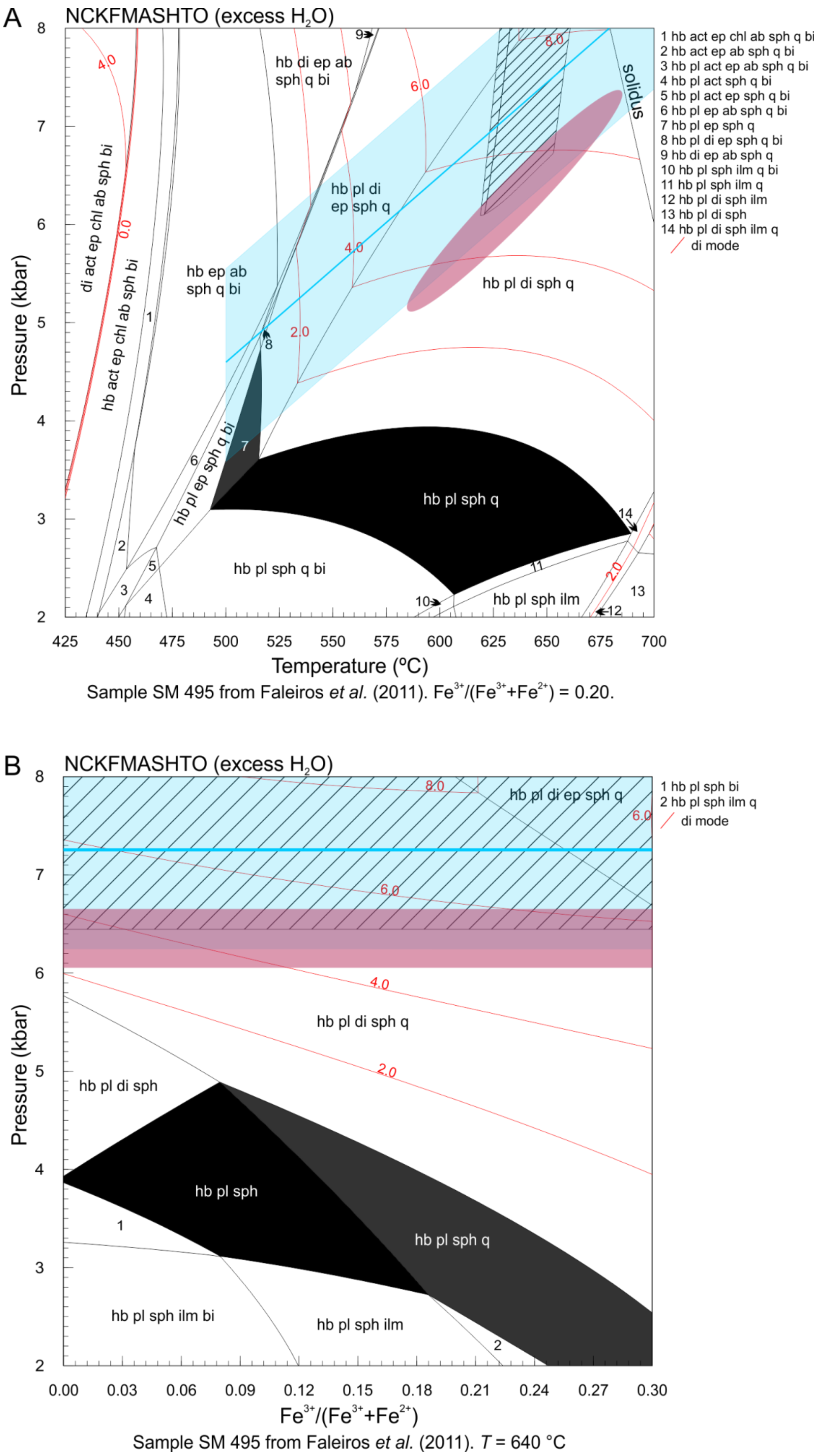

Figure 2.7. (a). The *P*-*T* results obtained by Yogi (2016) superimposed on the pseudosection calculated for sample SM 495 (figure 2.3b). The hatched polygons represent the fields where the metapelite parageneses are

stable, the pink ellipse represents THERMOCALC averagePT result, and the blue line represents GRASP barometer result, with the blue field representing its associated uncertainty. In the pseudosection, only the fields of the observed association are left colored. (b) A P-$X_{Fe^{3+}}$ pseudosection calculated for sample SM 495. The *P-T* results obtained by Yogi (2016) are superimposed, with the same symbology used in figure 2.7a. Again as in figure 2.7a, in the pseudosection only the fields of the observed assemblage are left colored.

Table 2.5. Comparison between the experimental products obtained by Apted & Liou (1983) and the assemblages predicted to be stable by pseudosection modelling for the same composition.

P(kbar), *T*(°C), f_{O2}(buffer)	Assemblages	
	Experimental run	pseudosection
7.0, 525, QFM	act ep chl ab q	hb di ep ab sph q bi
7.0, 550, QFM	act ep chl ab q	hb di ab sph q bi
7.0, 600, QFM	hb ep ab q	hb pl di sph q bi
7.0, 675, QFM	hb ep ab q	*suprasolidus*
7.0, 700, QFM	hb pl ep q	*suprasolidus*
7.0, 450, NNO	act ep chl ab q	di act ep chl ab sph bi
7.0, 500, NNO	act pl* ep chl q	hb di ep ab sph q bi
7.0, 525, NNO	act ep chl ab q	hb di ep ab sph q bi
7.0, 550, NNO	act ep chl ab q	hb di ep ab sph q bi
7.0, 575, NNO	hb ep chl ab q	hb pl di ab sph q bi
7.0, 600, NNO	hb ep ab q	hb pl di sph q
7.0, 650, NNO	hb ep ab q	hb pl di sph q
7.0, 700, NNO	hb pl ep q	*suprasolidus*
5.0, 500, NNO	pl* act ep chl q	hb di ep ab sph q bi
5.0, 525, NNO	hb pl ep chl q	hb di ep ab sph q bi
5.0, 550, NNO	hb ep ab q	hb pl di sph ab q bi
5.0, 600, NNO	hb ep ab q	hb pl di sph q
5.0, 650, NNO	hb pl q	hb pl di sph q

Epidote was produced in all but one of the considered runs, at 650 ºC (5 kbar/NNO), while the pseudosections predict it to be stable up to 525 ºC (7 kbar/ "QFM" pseudosection), 560 ºC (7 kbar/ "NNO" pseudosection) and 530 ºC (5 kbar/ "NNO" pseudosection). Albite, in turn, was obtained in the experiments at temperatures 70-100 ºC higher than the stability fields predicted in the pseudosections.

2.5.6 Sample RM 201

Sample RM 201 presents the mineral assemblage hornblende + plagioclase + sphene + ilmenite. Assuming the *P-T* conditions of 600 °C and 5.5 kbar (Moraes & Fuck, 1999), to be valid for this rock, the stable mineral assemblage according to the pseudosection would be hornblende + plagioclase + diopside + albite + sphene + biotite (Figure 2.4b). Ignoring quartz and biotite, the main mismatch between the observed mineral assemblage and the calculated pseudosection is the presence of diopside. In fact, as stressed before, diopside is calculated to be stable along all the covered *P-T* range, so that the observed mineral assemblage is not calculated to be stable anywhere in the pseudosection. Other discrepancies include the absence of ilmenite and presence of sphene in the calculated assemblage at the *P-T* conditions calculated by Moraes & Fuck (1999).

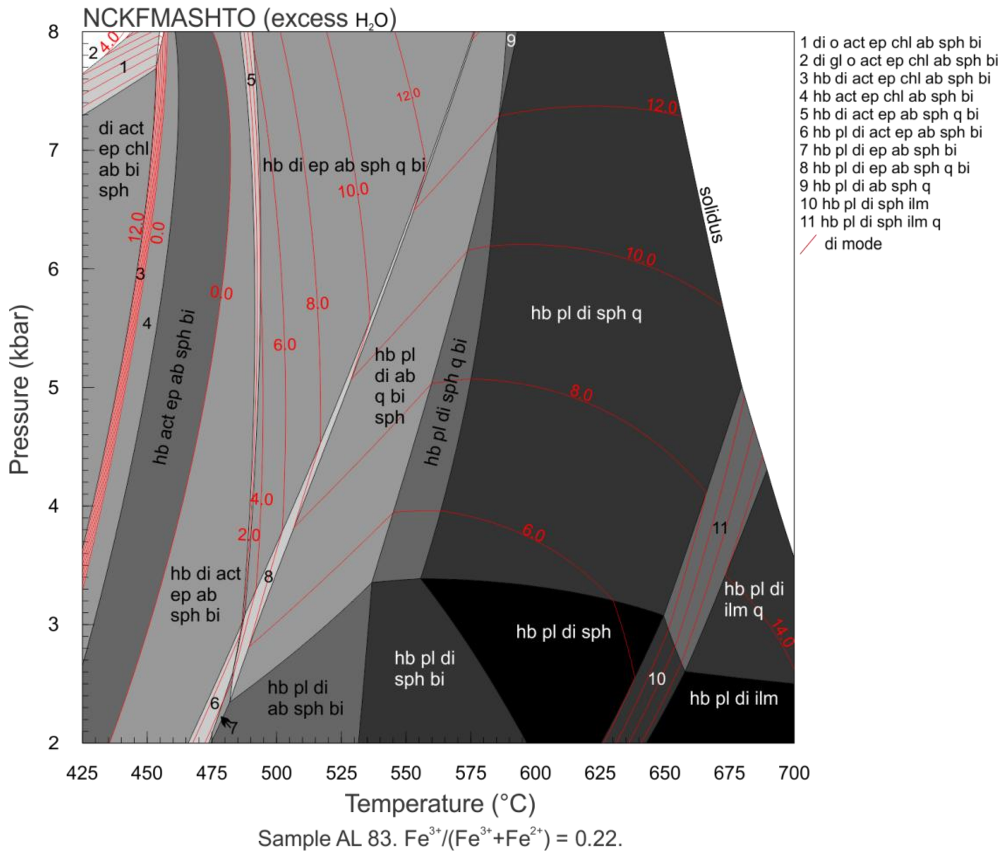

Figure 2.8. *P-T* pseudosections calculated for sample AL 83, with $X_{Fe^{3+}}$ = 0.22, value chosen to make the pseudosection comparable to the experiments whose oxygen fugacity was controlled by the NNO buffer.

2.6 Discussion

2.6.1 Overall accuracy of thermobarometric estimates for mafic rocks

Thermobarometry calculations in general are subject to uncertainties from several sources. Figures 2.6 and 2.7b, for example, show differences caused by choice of $X_{Fe^{3+}}$, but, besides that, uncertainties can also stem from choice of effective bulk-rock composition and choice of activity-composition models, plus the inherent uncertainties of the calculations. The magnitude of the imprecision one incurs by taking a given composition as the effective composition cannot be measured, but errors that stem from other sources can be estimated. In the P-$X_{Fe^{3+}}$ diagrams calculated here, P uncertainties given by THERMOCALC (via the calcsdnle script) are between 0.8 and 1.3 kbar, while T uncertainties in T-$X_{Fe^{3+}}$ diagrams (not shown) vary widely, from 5 to 200 °C (all values 1σ, as in Powell *et al.*, 1998). We specifically cite the values calculated for T- and P-$X_{Fe^{3+}}$ diagrams because we want to stress that all the uncertainty sources mentioned above operate simultaneously.

2.6.2 Garnet stability

In the discussion of the results for sample RM 29e, it was shown that there is a difference of 5.5 kbar between the pressure at which we consider the sample to have equilibrated and the lowest pressure at which garnet is calaculated to appear in the pseudosection. Of course, there are uncertainties in the data we used for comparison (see below, also *Introduction*), but this is a large difference, and these are not uncommon pressures for garnet to become stable in pseudosections for mafic bulk-rock compositions, as exemplified by the absence of garnet in all the other pseudosections calculated in this work (see also Green *et al.*, 2016). This is in contradiction not only with the data presented here, but also with other occurrences (*e.g.* Laird, 1980). The most likely cause to this difference is the absence of Mn in the activity-composition models, since, at least in metapelitic systems, Mn has a strong nucleation effect on garnet (Droop & Harte, 1995; Mahar *et al.*, 1997; Spear & Cheney, 1989; Symes & Ferry, 1992). It is noteworthy, however, that there are no studies that evaluate this effect in mafic compositions. Though almandine is usually the dominant end-member in garnet from metamafic rocks, grossular and pyrope are important as well (Deer *et al.*, 1982). It means that the presence or absence of garnet may affect the predicted stability and mode of all main constituents of metamafic rocks in these pseudosections, because if its components are not being "used" to form garnet, they will be available to stabilize other phases, like diopside and epidote (*e.g.* Forshaw *et al.*, in press). White *et al.* (2014b), working with thermodynamic modelling of metapelitic systems, pointed out that, with exception for the addition of garnet, there is little difference between the mineral assemblages calculated to be stable in Mn-bearing and Mn-free systems. An equivalent study about the influence of Mn on mafic systems is still to be undertaken, though.

2.6.3 Diopside stability

In four of the pseudosections calculated here diopside is stable at greenschist facies conditions, and, in fact, in two of them it is stable all along the covered *P-T* range. Diopside mode contours show that calculated diopside amounts are significant (up to 20%) and the highest modes occur at the lowest temperatures considered. Diopside stability under such low temperatures is in disagreement not only with experimental and thermobarometric calculations specific to the study samples, but also with mafic rocks in general (*e.g.* Apted & Liou, 1983; Bevins & Robinson, 1993; Cooper & Lovering, 1970; Laird, 1980; Spear, 1981, 1982; Wiseman, 1934). The comparison with the other investigated bulk-rock compositions indicates that the calculated occurrence of greenschist facies diopside, along with an associated minor overestimation of the stability field of hornblende, is mainly related to unsaturation in SiO_2. This is a trend that makes sense, since greenschist facies diopside is recorded, for example, in metaultramafic rocks (Trommsdorff & Evans, 1972; Evans, 1977). However, at least for mafic rocks, diopside stability in such low temperatures is clearly an overestimation. The cause of this behavior in the activity-composition models is hard to unravel. The activity-composition models used here (Green *et al.*, 2016; White *et al.*, 2014a; see also Powell & Holland, 1988, Holland & Powell, 1985, 2011) were designed to work as set, meaning that a discrepancy in some calculation can be related to any of the models, or to the relationships between two or more of them. Forshaw *et al.* (in press), working with upper amphibolite- and granulite-facies mafic rocks, found discrepancies between observed clinopyroxene and hornblende compositions and compositions calculated using THERMOCALC and the same activity-composition models used here. They point out several causes for these mismatches, including incorrect partitioning of Fe^{2+} and Mg between clinopyroxene and amphibole and a "direct" overstabilization of Al-rich hornblende (*i.e.* a problem in the amphibole activity-composition model). It is possible that the issues pointed out by Forshaw *et al* (in press) and the ones pointed out here are related, but our data do not allow this possibility to be evaluated.

2.7 Conclusions

The activity-composition models developed by Green *et al.* (2016), based on previous work by Diener *et al.* (2007) and Green *et al.* (2007), have been successful in describing the metamorphism of rocks of broad mafic composition, as can be seen in several works (White *et al.*, 2017; Tang *et al.*, 2017; Schorn, 2018). Specifically in this work, predictions based on pseudosections for mafic rocks agree with the data used for comparison in three out of the six studied examples. In the cases where there are mismatches, part of them are minor, sample-specific differences, that can, actually, be indicative of problems in the data used for comparison as much as problems in the activity-composition models used for construction of the pseudosections. However, most of the mismatches verified here are related to issues where the activity-composition models are clearly at fault, namely the stability fields of garnet and diopside. While the absence of manganese in the activity-composition models is easily identified as a very likely cause of the problem of the garnet stability field, the overestimation of the stability field of diopside is a quite different and more complex problem, for which we do not have an answer. Nonetheless, the data shows that this behavior of the activity-composition models occurs in rocks calculated to be unsaturated in SiO_2, and that it is linked to a similar, albeit less pronounced, overestimation of the stability field of hornblende. It should be stressed that this kind of problem cannot, in principle, be worked around simply by ignoring the phases at issue, because components either being (or not being) “used” in these phases will either be unavailable, or be available “in excess” to other phases, thus affecting their mode, composition and stability fields. Researchers should be aware of these issues when modelling SiO_2-poor and garnet-bearing low- to medium-grade metamafic rocks.

Despite, the enormous advances made in metamorphic petrology in the recent years, *P-T* estimates must always be seen critically, and the methods used for thermobarometric estimates should be thoroughly tested.

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3 THE GABBRO TO AMPHIBOLITE TRANSITION ALONG A HYDRATION–DEFORMATION FRONT

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Abstract: In most metamorphic terrains the transition to the preserved mineral assemblage can be established to have occurred during progressive metamorphism through lower-grade facies involving fluid saturated conditions. However, in some circumstances metamorphism can occur in a non-progressive way as a distinct overprint of either igneous protoliths such as gabbro, or of earlier higher-grade metamorphic rocks such as granulites. In non-progressive metamorphism the transformation commonly is mineralogically and/or texturally incomplete resulting in complex textural relationships between minerals. Two important factors in non-progressive metamorphism are the influx of fluid and the degree of accompanying deformation, which commonly show a strong positive correlation. Here, we describe a suite of mafic rocks from the Mantiqueira Complex, SE Brazil with varying amounts of fluid influx and degrees of deformation that range from weakly deformed metagabbro with complex corona textures to strongly foliated amphibolite with polygonal mineral textures. The samples form a continuum in terms of textural relationships and mineral compositions, but they can be divided into three main types: metagabbro, foliated metagabbro and amphibolite. Metagabbro samples preserve both relict igneous and metamorphic textures and a combination of igneous and metamorphic mineralogy. They preserve a variety of reactions textures, such as coronas of garnet around ilmenite, double coronas of low-Al (*actinolitic*) and high-Al (*pargasitic*) hornblende around clinopyroxene and limited degrees of recrystallization of igneous plagioclase. Foliated metagabbro samples preserve similar reaction textures as the metagabbro but are foliated and have higher contents of pargasitic hornblende and polygonal plagioclase combined with lower contents of clinopyroxene, igneous plagioclase and actinolitic hornblende. Amphibolite samples are composed by pargasitic hornblende and polygonal plagioclase, presenting little igneous plagioclase and practically no garnet and clinopyroxene, and they preserve none of the reaction textures of the other two types. These samples are interpreted to be near chemically equilibrated on a hand sample scale, though with some mineral zoning preserved. We use P-X_{H_2O} and T-X_{H_2O} pseudosections to show that the main mineral assemblage differences between the amphibolites and the other two types are primarily controlled by the amount of H_2O that

equilibrated with the rocks. While all rocks experienced an influx of fluid, only the amphibolites represent thermodynamically fluid-saturated conditions — the metagabbro and foliated metagabbro having equilibrated under H_2O undersaturated conditions, allowing the presence of garnet. In parallel with the variation in fluid influx, the variation in microstructure appears to be the result of varying degrees of deformation combined with varying length scales of diffusion. The complex corona structures in the lower strain metagabbros are interpreted to reflect the pre-existing igneous texture and the apparent low mobility of Al during metamorphism. Here, igneous clinopyroxene is largely pseudomorphed by the actinolitic hornblende whereas the higher-Al pargasitic hornblende and garnet occur adjacent to plagioclase. Zoning patterns in some large amphibole crystals in the amphibolite are similar to those in metagabbro samples with more actinolitic cores and pargasitic rims. Such features are consistent with earlier stages of the evolution of the amphibolite being similar to those preserved in the metagabbro.

Keywords: gabbro, reaction textures, hydration

3.1 Introduction

Metamorphic rocks are usually investigated in terms of occurrence of systematic changes in the series of mineral assemblages developed in response to changes in temperature and pressure, which is connected with bulk-rock composition and served as the backbone for the proposition of metamorphic facies (Eskola, 1939). Further investigations have shown that the application of equilibrium thermodynamics to metamorphic rocks to define the connection between mineral assemblages, temperature and pressure is useful (Spear, 1993; Powell *et al*, 2005). This approach to investigate metamorphism presumes diffusion occurs within a given rock volume in an effective way, with any chemical potential gradients developed in response to changes in pressure and temperature being transient features (*e.g.* White *et al.*, 2008). Thus, for the relevant components it is possible to equilibrate the chemical potentials within a given rock volume, along a portion of the *P-T* path, on some scale comparable to a hand specimen, thin section or small domain (Stüwe, 1997; White *et al.*, 2008; White & Powell, 2011; Guevara & Caddick, 2016). Since metamorphic reactions deal mostly with solid phases, they are kinetically slow, and thus the presence of fluid or melt, grain size and deformation each play a critical role in reaction progression and equilibration (Rubie, 1986; Austrheim, 1987; Goergen *et al.*, 2008; Guiraud *et al.*, 2001; Putnis & Austrheim, 2010; Schorn & Diener, 2017; Williams & Jercinovic, 2012).

If chemical potential gradients cannot be equalized on the scale of interest, then their persistence may result, for example, in the formation of complex reaction textures, in which symplectites and/or coronas separate apparent reactant minerals. The study of such textures can give insights into the reactions and processes that took place during metamorphism (Carmichael, 1969; White *et al.*, 2008; Štípská *et al.*, 2010) and can also be used to infer portions of the *P-T* paths followed by the rock (Robinson, 1991; Moraes *et al.*, 2002; Baldwin *et al.*, 2007).

The metamorphic peak temperature conditions are associated with the attainment of chemical equilibrium in a rock due to high temperatures, and its preservation due to it representing the highest degree of dehydration, which inhibits retrograde metamorphism. However, the degree of retrograde metamorphism will be in part determined by the amount of fluid (Guiraud *et al.*, 2001) or melt (Moraes *et al.*, 2002; White & Powell, 2002, 2010) that remains in the rock or is added during cooling. Retrograde metamorphism appears to occur on a small scale involving compositional micro-domains that are formed between host mineral and its inclusions or in contacts among two or more minerals. During cooling or decompression these compositional micro-domains are commonly characterized by symplectites and coronas (*e.g.* Harley, 1986; Moraes *et al.*, 2002; White *et al.*, 2001). Another situation in which reaction textures may be developed is related to non-progressive metamorphism, when igneous rocks or older metamorphic rocks, commonly originally coarse-grained and H_2O-poor, are subjected to subsequent metamorphism. In rocks such as gabbro, the transformation to typical metamorphic minerals and textures may be incomplete in the absence of sufficient fluid or deformation (*e.g.* Whitney & McLelland, 1983; Rivers & Mengel, 1988; Nicollet & Goncalves, 2005; Schorn & Diener, 2017; White & Clarke, 1997).

This work aims at using a suite of metamafic rocks to illustrate the evolution of metamorphic and textural changes between a gabbro and an amphibolite, and at expanding the knowledge on this transition through use of thermodynamic modelling with THERMOCALC.

3.2. Geological Setting

The studied samples come from the Mantiqueira Complex, which is a unit that forms a belt at the southeastern margin of the São Francisco Craton, southeastern Brazil (Figure 3.1). It is composed of intensely foliated migmatites and banded gneisses, whose compositions range from granite to tonalite, among which amphibolite lenses and boudins occur (Baltazar & Raposo, 1993; Duarte *et al.*, 2004). The Mantiqueira Complex presents Archean to

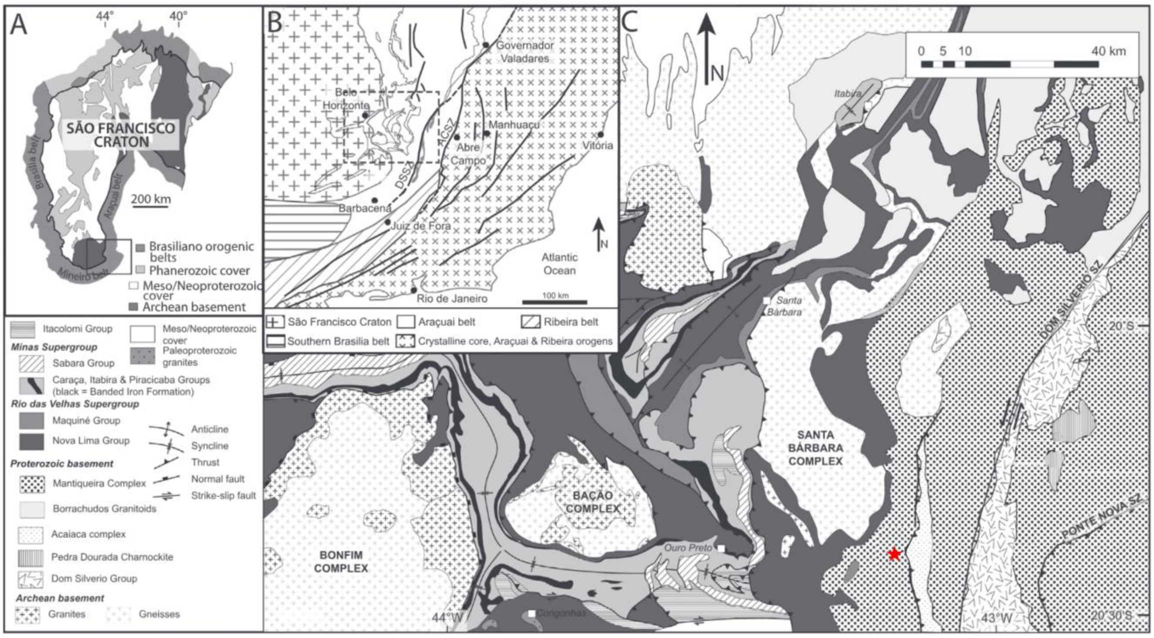

Figure 3.1. (a) – Geology of the area where the study samples where collected, according to Cutts (2018). The red star represents the approximate location of the study samples.

Paleoproterozoic crystallization ages and apparently a polycyclic metamorphic history, reaching the amphibolite facies; it is interpreted to correspond to a portion of the São Francisco Craton reworked during the Neoproterozoic (Brueckner *et al.*, 2000; Figueiredo & Teixeira, 1996; Noce *et al.*, 2007).

3.3. Geochemistry

Whole-rock chemical analyses were obtained by X-ray fluorescence in the X-ray Fluorescence Laboratory of the NAP Geoanalítica - Institute of Geosciences, University of São Paulo, Brazil, using a PANalytical AXIOS MAX spectrometer. Fused glass discs were prepared for analyses of major elements, while pressed powder pellets were prepared for analyses of minor elements. Both were prepared according to the procedures described by Mori *et al.* (1999).

Six samples representing Mantiqueira Complex metamafic rocks were analyzed (Table 3.1). The samples include the three petrographic types described below, metagabbro, foliated metagabbro and amphibolite. All the samples can, by their composition, be classified as basalts (Figure 3.2a), according to the TAS diagram of Le Maitre *et al.* (1989); most of the samples have the same composition, with 49wt% SiO_2, 13wt% Al_2O_3, 10wt% CaO and $Mg/(Mg+Fe^{2+})$ ratio of 0.5 (Figures 3.2b-e).

Table 3.1. Whole rock analyses of metamafic rock samples from Mantiqueira Complex. Total Fe as FeO. Values are in wt%.

Sample	PNF 01A	02 IV 10A	06 IX 54	06 X 66	07 II 08	07 III 07C
SiO_2	47.87	49.46	48.98	49.14	49.09	49.30
TiO_2	2.49	2.113	2.35	2.02	2.02	2.22
Al_2O_3	13.68	13.93	13.84	13.98	13.87	13.88
FeO	14.08	12.49	12.93	12.95	12.25	12.63
MnO	0.22	0.21	0.21	0.22	0.21	0.21
MgO	6.84	6.49	6.27	6.34	6.89	6.49
CaO	10.78	10.89	10.35	10.56	11.21	10.67
Na_2O	2.09	2.43	2.26	2.17	2.31	2.34
K_2O	0.41	0.52	0.52	0.54	0.46	0.65
P_2O_5	0.17	0.23	0.23	0.26	0.20	0.24
LoI	0.02	0.26	0.29	0.17	0.02	0.45
Total	98.64	99.02	98.23	98.34	98.53	99.07

3.4 Petrography

The petrographic study was carried out on 23 samples and correspondent thin sections, from which the samples analyzed for whole-rock composition and mineral chemistry were selected. In the following description dark green amphiboles will be referred to as *pargasitic hornblende*, while colorless to pale green amphiboles will be referred to as *actinolitic hornblende*. Classification details are presented in section 3.5.

The Mantiqueira Complex metamafic rocks studied here crop out as decimetric to metric blocks near the town of Acaiaca, Minas Gerais. There are two main concentrations of blocks, located approximately 780m one from another. Although the similar composition and petrographic features (see below) between the outcrops are consistent with a common protolith, the outcrop characteristics do not allow the spatial relationships between each sample to be established. There is a continuum of textural and mineralogical variation between the samples, and they can be subdivided into three basic types: *metagabbro*, *foliated metagabbro*, and *amphibolite*. These types are described below.

3.4.1 Metagabbro

Metagabbro samples (PNF 01A, 02-IV-10A, 05-III-20, 07-II-08, 09-VIII-8A) are medium-grained and display a hypidiomorphic granular texture (Figure 3.3a). They are composed of 30–35% plagioclase, 35–40% pargasitic hornblende, 10–15% actinolitic hornblende, 10–15% clinopyroxene and accessory amounts of garnet, biotite, ilmenite and quartz. Plagioclase grains of inferred igneous origin are tabular, up to 2 mm long, and their rims usually are corroded. Some samples present a minor second generation of plagioclase, formed by smaller (0.02 mm), polygonal crystals, which occur at the rims of and along fractures in the igneous tabular crystals (Figures 3.5a-b). Clinopyroxene crystals are subhedral and can be up to 0.5 mm long.

The metagabbro samples present a wide variety of reaction textures. The most common of these is actinolitic hornblende that partially to totally pseudomorphs igneous clinopyroxene, and is, in turn, mantled by pargasitic hornblende (Figures 3.5a–d). Actinolitic hornblende is pale green to almost colorless, fine-grained and rarely has cummingtonite exsolution lamellae (Figure 3.4a). The petrographic distinction between clinopyroxene and actinolitic hornblende is in places difficult because the replacement of clinopyroxene by actinolitic hornblende commonly starts along micrometer-scale planes (Figure 3.4b). Quartz may occur associated with actinolitic hornblende, as micrometric round crystals inside the pseudomorphs. This association occurs where the replacement of clinopyroxene is nearly complete. In contrast to the actinolitic hornblende, pargasitic hornblende is coarser grained and dark colored. Although uncommon, pargasitic hornblende may be in direct contact with clinopyroxene. Another common reaction texture consists of anhedral ilmenite crystals partially or totally mantled by garnet (Figures 3.5e, f) which commonly presents well-formed crystal faces against surrounding plagioclase or hornblende. Additionally, garnet may also occur as small isolated euhedral crystals without an apparent ilmentite core and along contacts between plagioclase and pargasitic hornblende. Garnet in the coronas may present biotite and hornblende inclusions, and can also present hornblende and/or biotite intergrowths. (Figures 3.5e, f) and ilmenite may be mantled by hornblende or biotite, in garnet-free textures (Figures 3.6c, d). Combinations of the different textures not only can occur, but are, actually, the most common case. Pargasitic hornblende is usually present at the interstices between large, igneous plagioclase crystals (Figures 3.6e, f). Crystals of ilmenite, clinopyroxene and plagioclase are never found in mutual contact. Ilmenite may display hematite exsolution lamellae (Figure 3.4c).

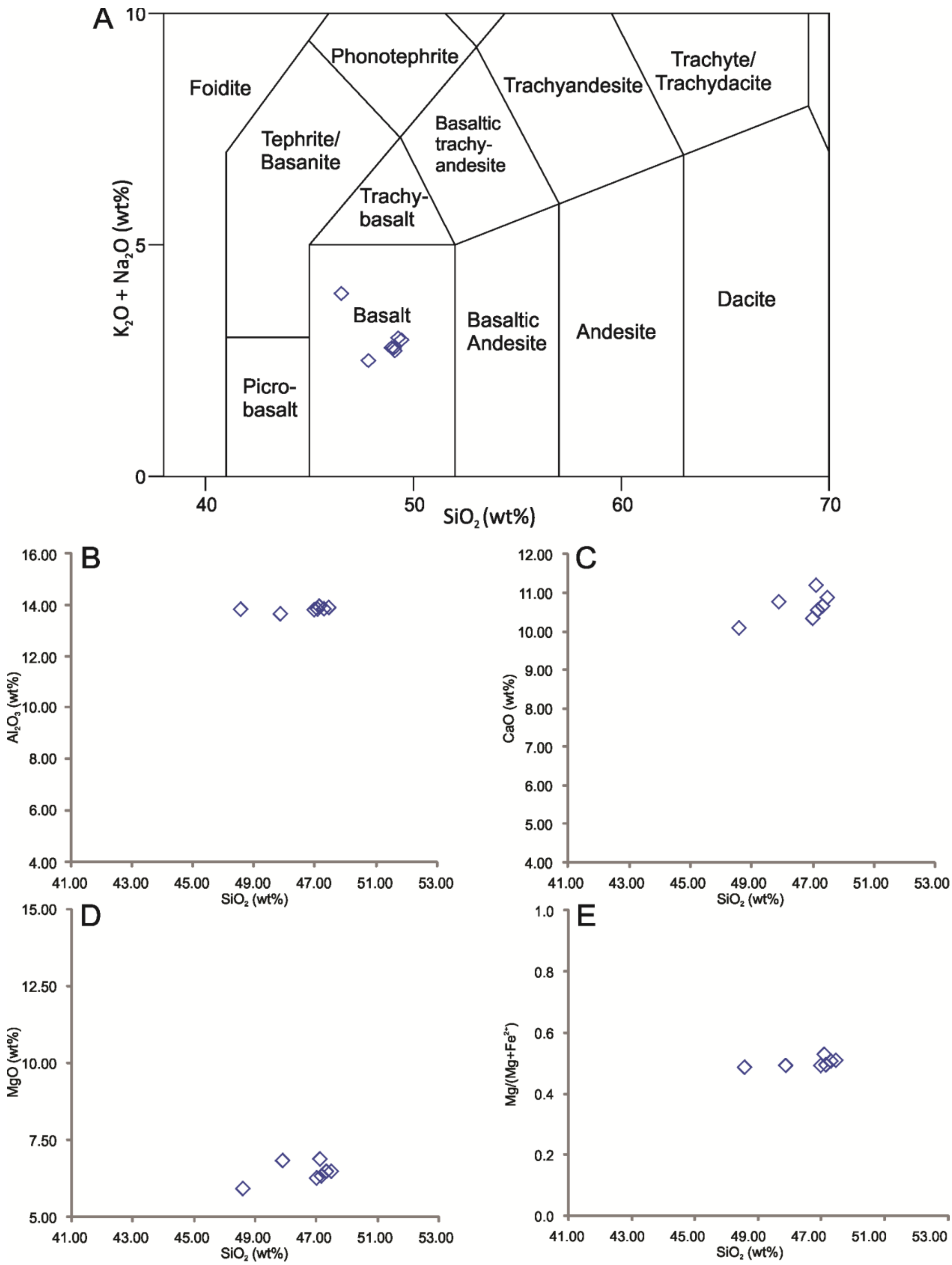

Figure 3.2. (a) - Compositions of some of the study samples plotted on the diagram for classification of volcanic rocks of Le Maitre *et al*. (1989). (b-e) - bivariate plots showing chemical compositions of the same samples.

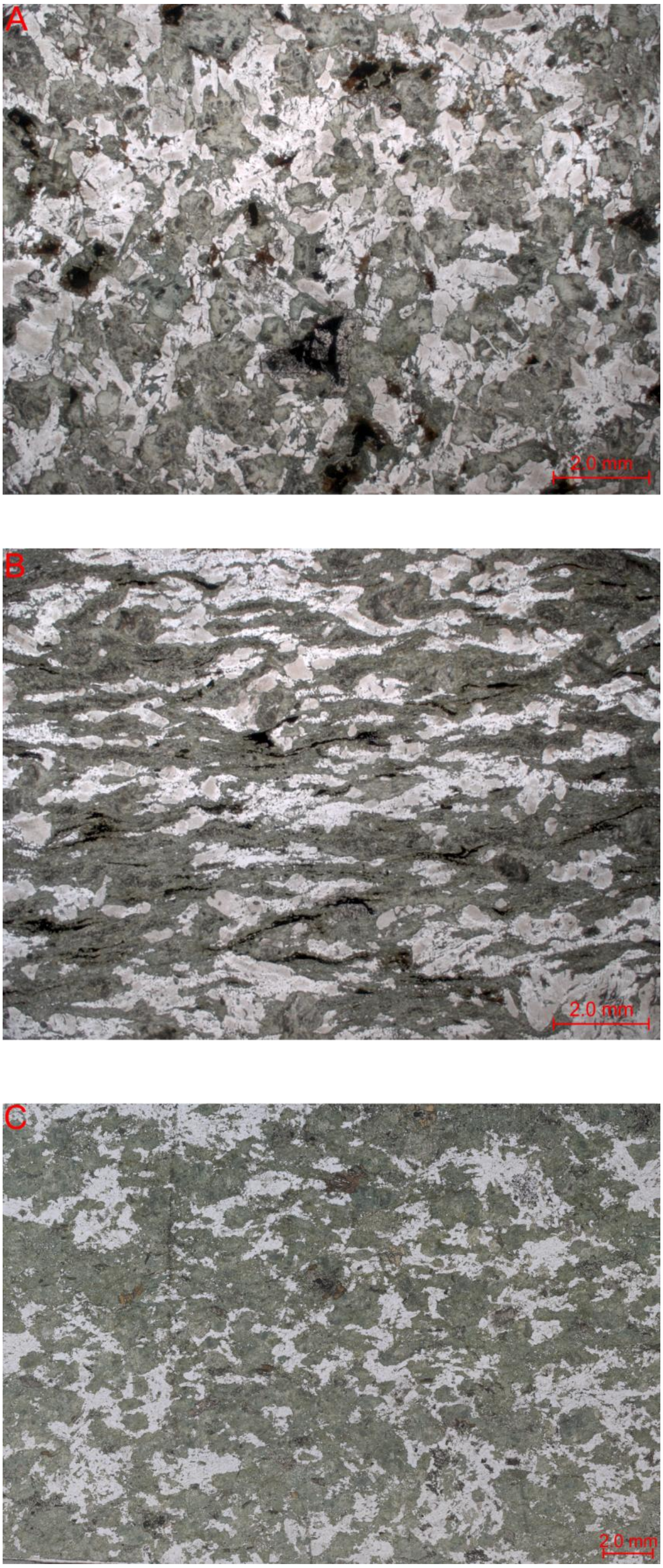

Figure 3.3. General aspects of the study rocks. (a) metagabbro. (b) foliated metagabbro. (c) amphibolite.

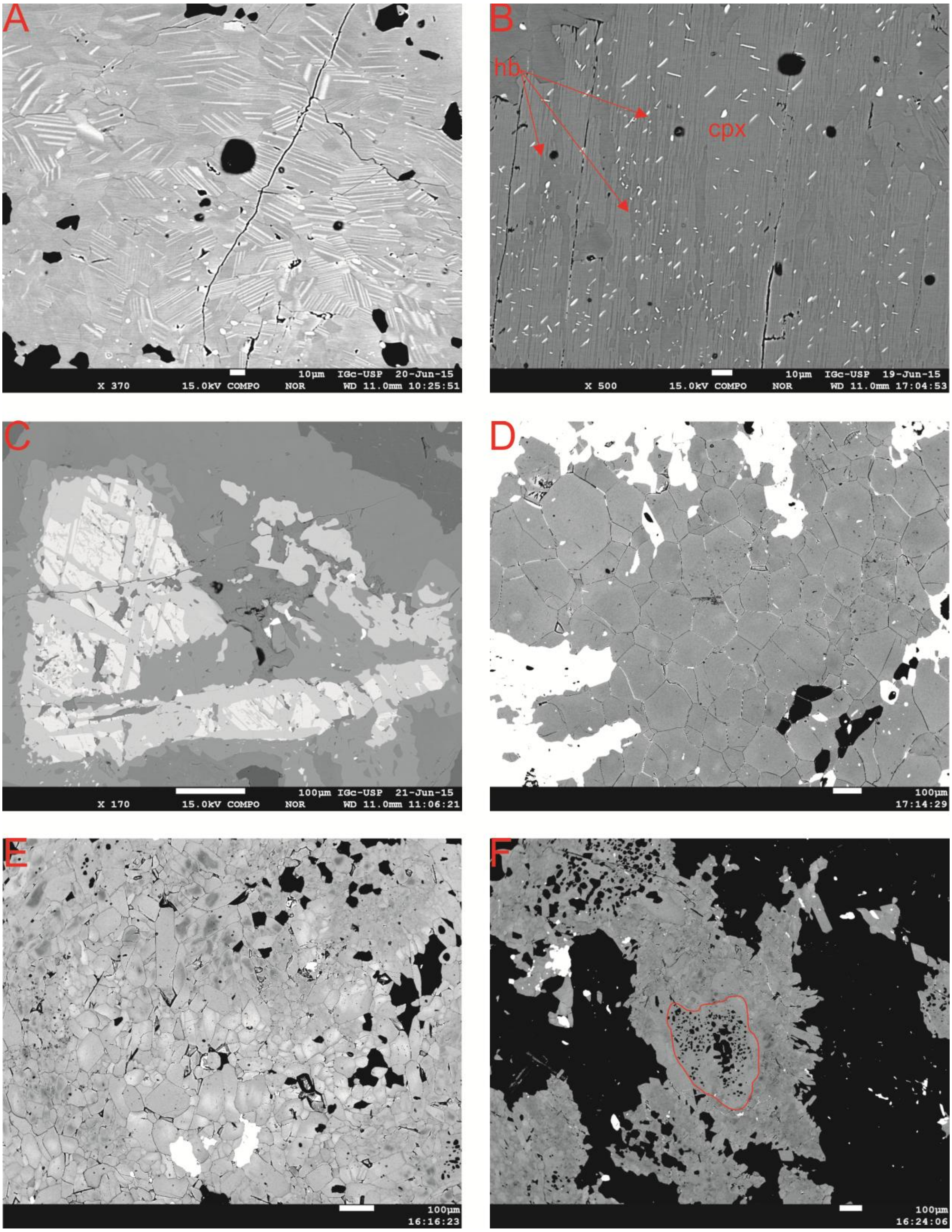

Figure 3.4. Detailed textural features of the studied rocks. All figures are back-scattered electron images. (a) - cummingtonite exsolution lamellae (brighter) in actinolitic hornblende crystals (darker) in metagabbro sample. (b) - replacement of pyroxene by actinolitic hornblende along micrometric planes in metagabbro sample. (c) - hematite-ilmenite lamellae (brighter) in ilmenite crystal (darker) in metagabbro sample. (d) - polygonal plagioclase crystals in amphibolite sample. (e) - polygonal pargasitic hornblende crystals in amphibolite sample. Note the presence of two types of zoning: with actinolitic (darker) cores (top-center, up left corner) and with pargasitic (brighter) cores (bottom-center). (f) pargasitic hornblende pseudomorph after clinopyroxene.

3.4.2 Foliated metagabbro

Foliated metagabbro samples (07-III-7C, 09-XII-8B) are medium-grained and display a pervasive foliation, defined by elongate, 0.2 to 1.0 mm thick intercalated aggregates, one type composed of tabular plagioclase + polygonal plagioclase ± fine-grained pargasitic hornblende and the other type composed of pargasitic hornblende + actinolitic hornblende ± clinopyroxene ± ilmenite ± garnet ± quartz (Figure 3.3b). In these samples clinopyroxene (2-5%), actinolitic hornblende (5-10%) and tabular plagioclase (15-20%) are modally less common than in the metagabbro, while the proportion of pargasitic hornblende (≈50%) and fine-grained polygonal plagioclase (15-20%) is higher. Some igneous plagioclase remnant crystals are surrounded by polygonal metamorphic plagioclase aggregates (Figures 3.6c, d). The modal amount of each of garnet, biotite and ilmenite show no significant variation relative to what is observed in the metagabbro samples

In foliated metagabbro samples actinolitic hornblende occurs as pseudomorphs after clinopyroxene, which are, in turn, mantled by pargasitic hornblende as in the metagabbro, and the textural similarity includes the replacement of clinopyroxene along micrometer-scale planes. The pseudomorphs are commonly wrapped by the minerals that define the foliation (Figure 3.7d). However, in cases where the replacement of clinopyroxene is complete or nearly complete the texture evolves to elongated aggregates (Figure 3.7c).

Garnet commonly forms mantles around ilmenite crystals, but, in contrast to metagabbro, they form elongated textures aligned with the foliation (Figures 3.6a, b). Garnet commonly displays intergrowths or small inclusions of hornblende and biotite. Hornblende and biotite can, albeit less commonly than in the metagabbro, mantle ilmenite crystals, and combinations of the different textures are common. As in the metagabbro samples, hornblende occurs in interstices between plagioclase crystals.

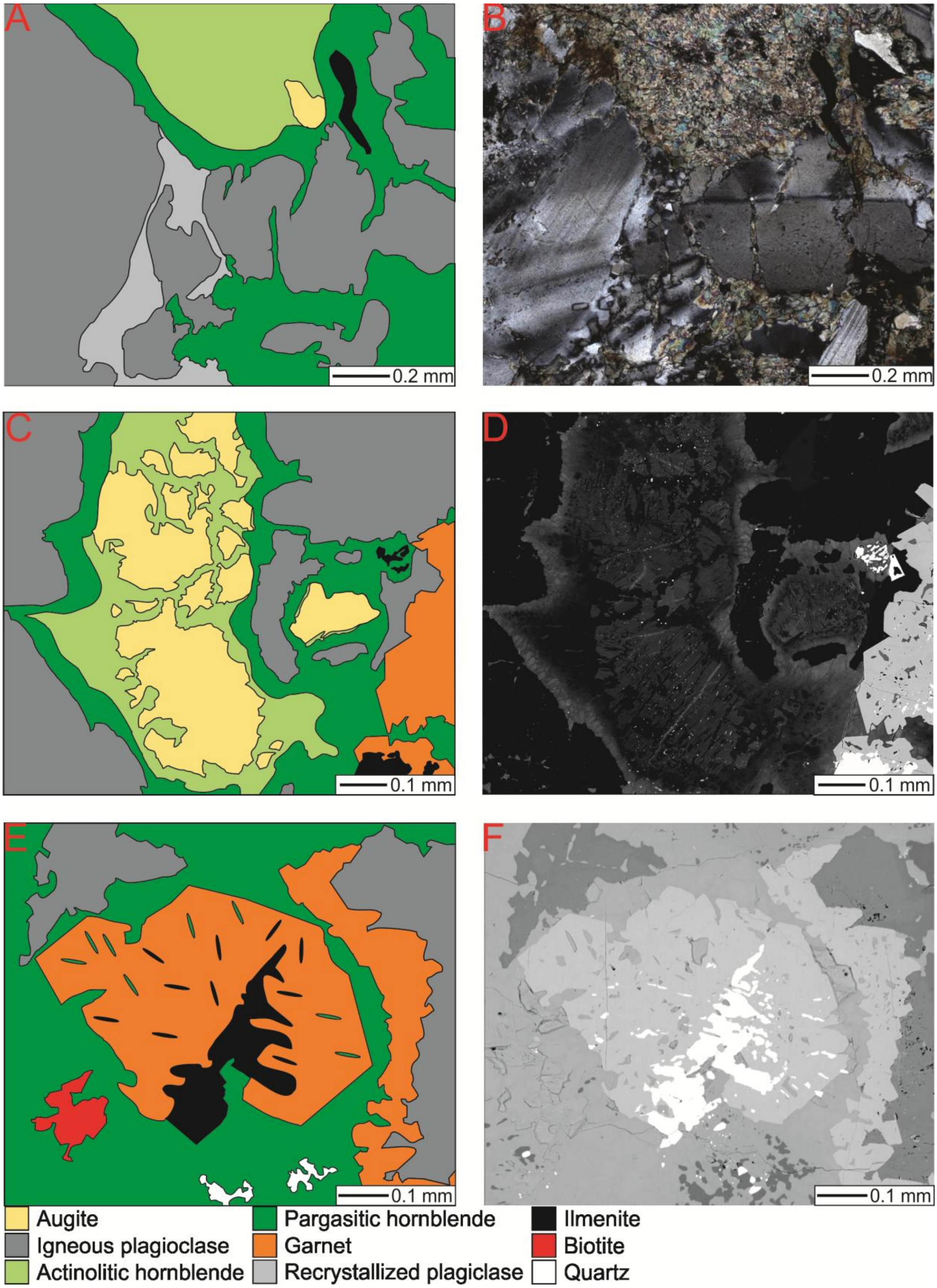

Figure 3.5. Textural features in metagabbro samples, as simplified sketches (left) and optical microscope or backscattered electron images (right). (a-b) - metamorphic plagioclase at igneous plagioclase rims. Note ilmenite crystal mantled by pargasitic hornblende. (c-d) - clinopyroxene crystal partially replaced by actinolitic hornblende and mantled by pargasitic hornblende. (e-f) - ilmenite mantled by garnet, and garnet in contact between hornblende and plagioclase.

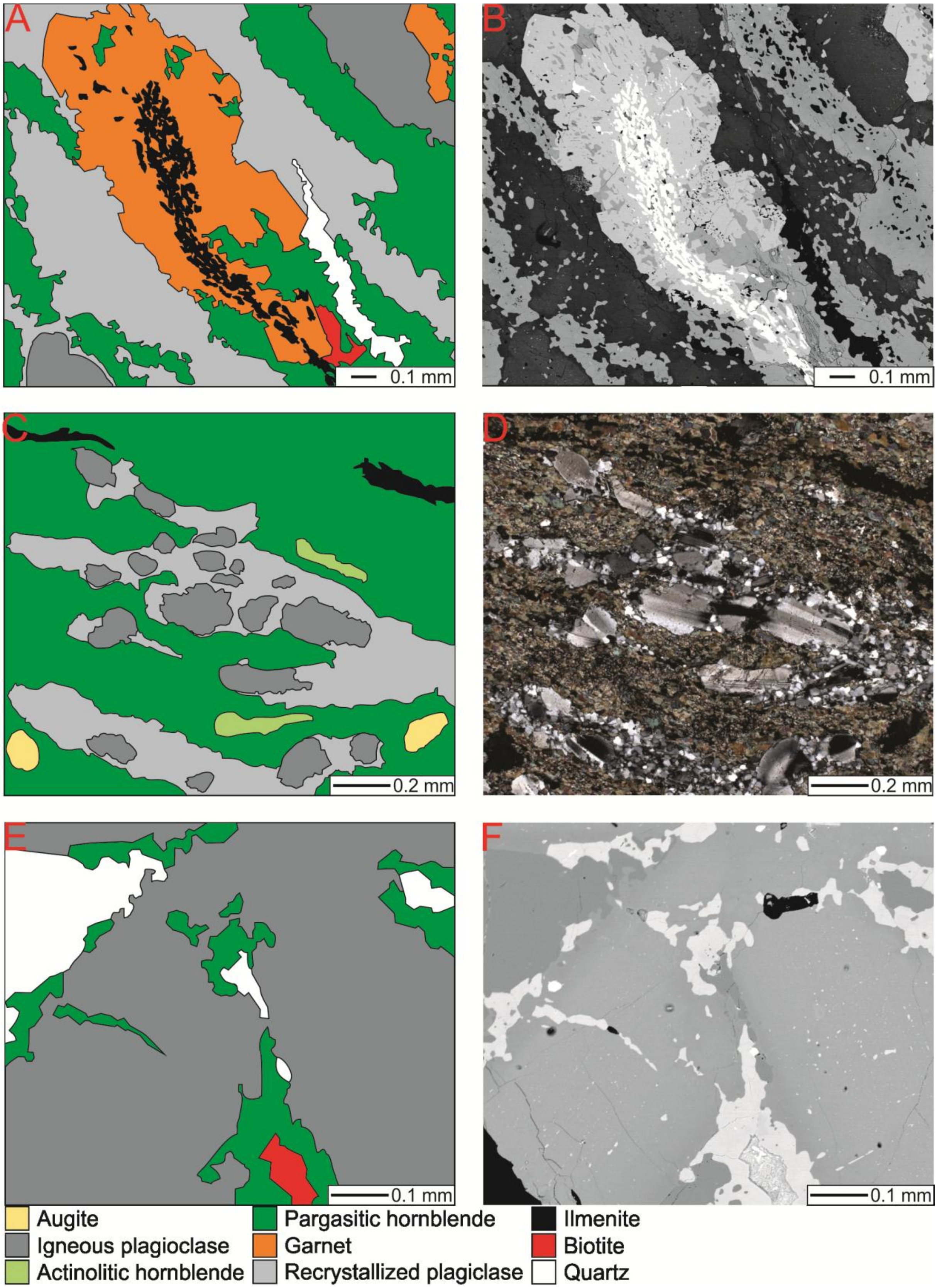

Figure 3.6. Textural features in metagabbro and foliated metagabbro samples, as simplified sketches (left) and optical microscope or backscattered electron images (right). (a-b) - ilmenite mantled by garnet in foliated metagabbro sample. Note the elongation of the aggregate. (c-d) - igneous plagioclase remnants in metamorphic plagioclase aggregate in foliated metagabbro sample. (e-f) - pargasitic hornblende in fractures and contacts between plagioclase crystals in metagabbro sample.

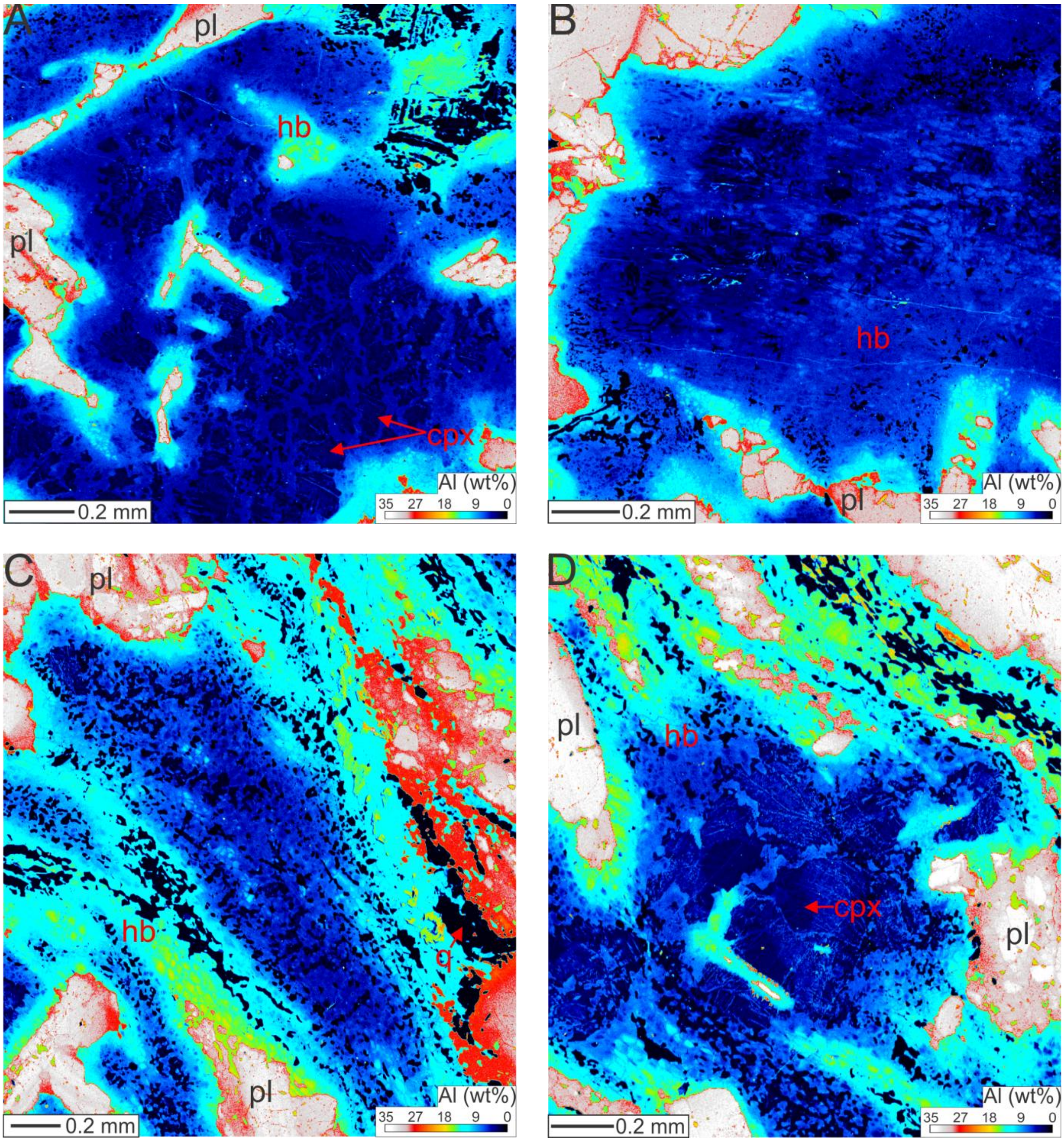

Figure 3.7. WDS compositional maps showing the abundance of Al in textures from samples from Mantiqueira Complex. Black areas correspond to pyroxene, quartz or cummingtonite, white to red areas correspond to plagioclase, while dark blue to green areas correspond to hornblende. (a-b) metagabbro samples. (c-d) foliated metagabbro samples.

3.4.3 Amphibolite

Amphibolite samples (PNF 01B, 06-IX-54, 06-X-66) are fine- to medium grained and display variable intensity of foliation, which is defined by intercalated submilimetric aggregates of pargasitic hornblende and metamorphic plagioclase (Figure 3.3c). They are composed of ≈60% pargasitic hornblende and ≈30% fine-grained polygonal plagioclase. Both plagioclase and pargasitic hornblende occur as fine-grained polygonal crystals (Figures 3.4d, e), although hornblende can rarely occur as larger crystals, possibly pseudomorphs after clinopyroxene (Figure 3.4f). These samples bear minor proportions of igneous plagioclase, actinolitic hornblende and ilmenite, almost no garnet or clinopyroxene, and contain accessory proportions of quartz, sphene, and biotite, and, in some samples, scapolite. In contrast to the types described previously, these samples preserve no reaction textures, except for sphene mantles around ilmenite. The rare garnet crystals are idioblastic.

3.5 Mineral Chemistry

Mineral chemistry data, along with back-scattered electron images and WDS compositional images, were obtained with a JEOL JXA-FE-8530 equipment at the Electron Microprobe Laboratory of the NAP Geoanalítica - Institute of Geosciences/University of São Paulo; with a JEOL JXA-8230 Superprobe at the Electron Microprobe Laboratory of the Institute of Geosciences and Exact Sciences/São Paulo State University (Rio Claro) and at the Electron Microprobe Laboratory of the Institute of Geosciences/University of Mainz using a JEOL JXA-8900. Analyses were carried on using 15 kV acceleration voltage and 20 nA probe current, with probe diameter of 5 µm for all minerals except plagioclase, for which 10 µm probe diameter was used. Synthetic and natural mineral standards were employed for element calibration. Representative analyses are given in Tables 3.2-3.5

For ilmenite, hematite, garnet and clinopyroxene the Fe^{3+}content was calculated using the method described by Droop (1987). For amphiboles the Fe^{3+}content was calculated using the Schumacher method (described in Leake *et al.*, 1997).

Most of the analyzed amphiboles are calcic amphiboles and they show a relatively large compositional variation (see Figures 3.8-3.10), plotting into several fields of the classification diagrams of Hawthorne *et al.* (2012). The crystals referred to as *actinolitic hornblende* are mostly classified as magnesio-hornblende, but also include actinolite and magnesio-ferri-hornblende, while the ones referred to as *pargasitic hornblende* are most commonly classified as ferro-pargasite, but also contain pargasite, magnesio-ferri-hornblende and magnesio-hornblende. For purposes of this work, *actinolitic hornblende* is used as purely descriptive term, with no relation to the classification of Leake (1978) intended.

Given their similarities, metagabbro and foliated metagabbro samples will be treated together in the following description, while amphibolite samples will be discussed separately.

3.5.1 Hornblende

Hornblende is the main phase of the studied rocks. Due to the large number of analyses performed, data from each sample is shown separately in Figures 3.8-3.10.

In the metagabbro and foliated metagabbro samples hornblende can be divided into two groups: the near-colourless crystals that occur as pseudomorphs after clinopyroxene (actinolitic hornblende) and the dark-colored crystals that occur in different textural contexts (pargasitic hornblende). Actinolitic hornblende has ^{VI}Al contents between 0.1 and 0.4 apfu, ^{IV}Al between 0.3 and 1.0 apfu, $^{A}(Na+K)$ between 0.04 and 0.4 apfu and $Mg/(Mg+Fe^{2+})$ between 0.6 and 0.75 (Figures 3.8, 3.9). Some actinolitic hornblende crystals contain cummingtonite exsolution lamellae with low ^{VI}Al, between 0.0 and 0.2 apfu, ^{IV}Al between 0.2 and 0.5 apfu, Ca between 0.4 and 0.9; $Mg/(Mg+Fe^{2+})$ between 0.5 and 0.6 and $^{A}(Na+K)$ between 0.04 and 0.1.

The composition of pargasitic hornblende crystals is largely independent from textural context: ^{VI}Al varies between 0.4 and 0.8 apfu, ^{IV}Al between 1.2 and 2.1 apfu, $^{A}(Na+K)$ between 0.4 and 0.8 apfu, and $Mg/(Mg+Fe^{2+})$ between 0.4 and 0.6. In detail, it can be noted that hornblende in interstices between plagioclase crystals has lower Ti than hornblende that mantles clinopyroxene pseudomorphs, which, in turn, has lower Ti than hornblende associated with garnet or ilmenite.

The compositional transition from the pseudomorphs to the mantles is abrupt, and the mantles themselves are compositionally zoned, with more pargasitic compositions towards the contact with plagioclase. In the foliated metagabbro it can be noted that individual hornblende crystals may be zoned, usually displaying more actinolitic cores and pargarsitic rims, but in rare cases displaying the reverse (Figure 3.7). Furthermore, while in the unfoliated samples the distribution of the pargasitic hornblende crystals closely follows the contacts between the hornblende aggregates and plagioclase, this pattern is less pronounced in the foliated samples.

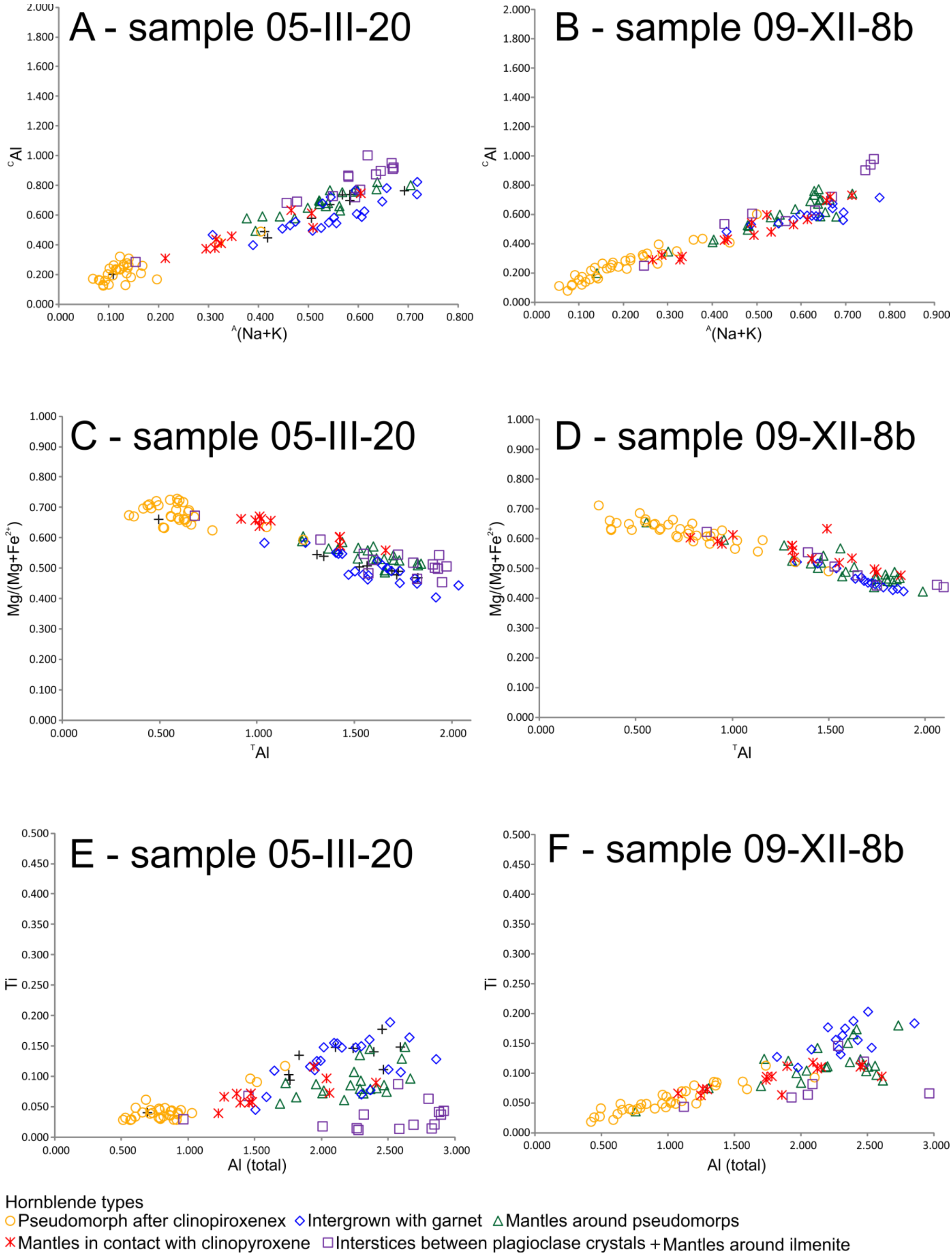

Figure 3.8. Chemical variation of hornblende from a metagabbro sample 05-III-20 (a, c, e) and from foliated metagabbro sample 09-XII-8B (b, d, f).

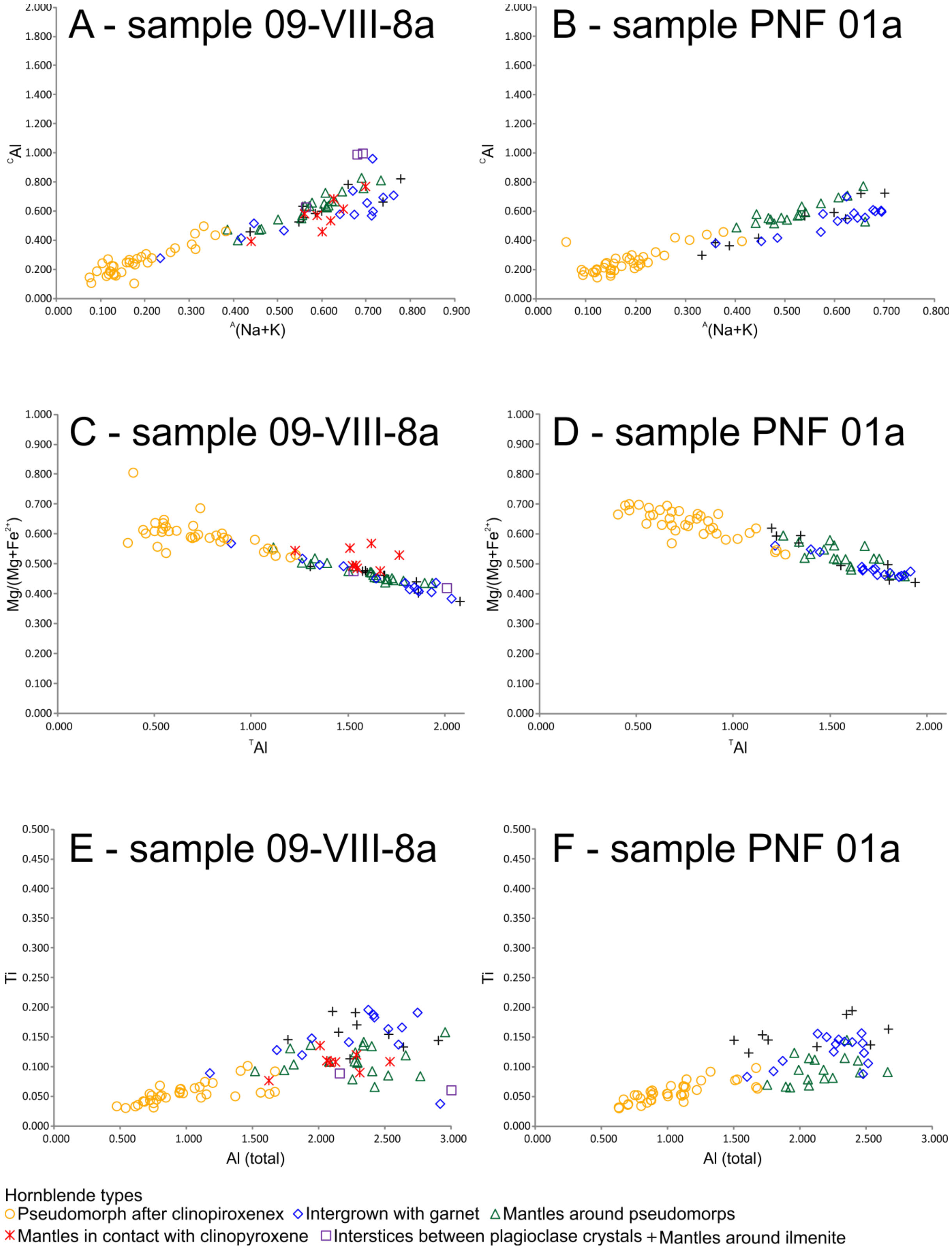

Figure 3.9. Chemical variation of hornblende from two metagabbro samples 09-VIII-8A (a, c, e) and PNF 01A (b, d, f).

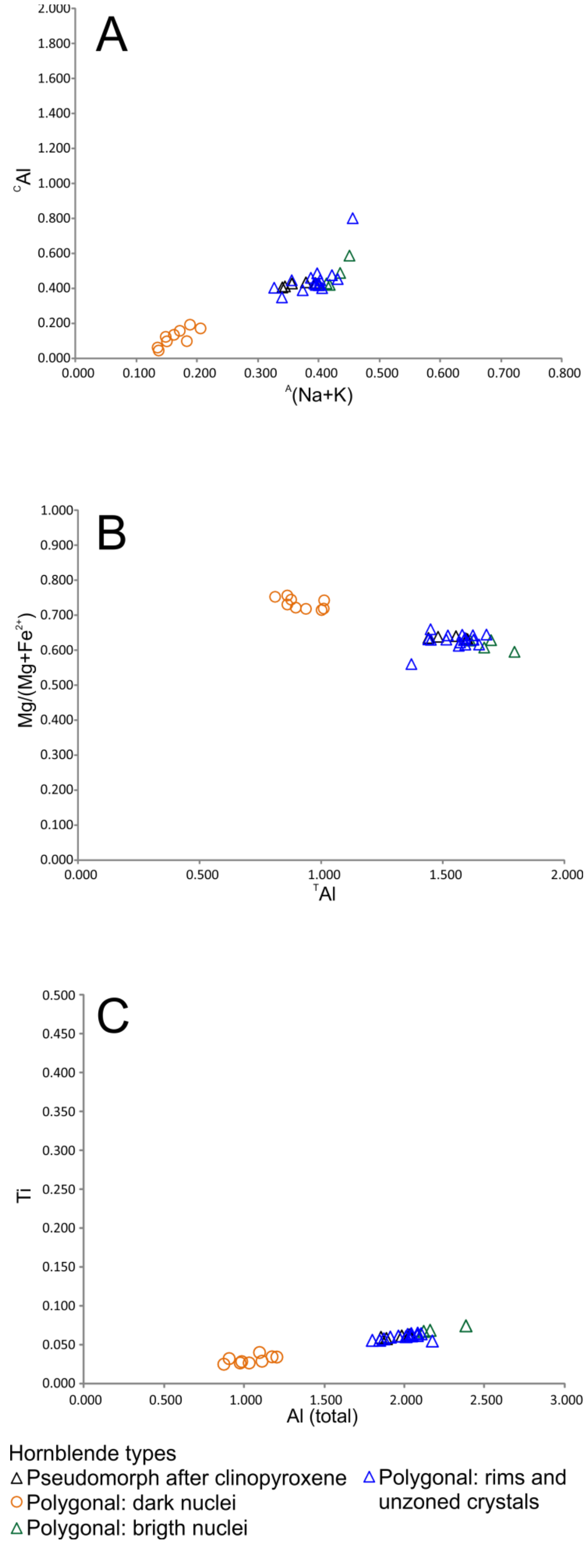

Figure 3.10. Chemical variation of hornblende in an amphibolite sample.

Table 3.2. Representative analyses of amphibole from the study rocks. Total Fe oxide as FeO, with Fe^{3+} estimated using the method of Schumacher (described in Leake *et al.*, 1997). Abbreviations: *Text. cont.* - Textural context; *Mant. pseudomorph* - mantles around clinopyroxene pseudomorphs; *As.* - associated to a given mineral, *e.g.*: As g = associated to garnet; *cu exs* - cummingtonite exsolution lamellae.

Mineral	Amphibole										
Rock	Metagabbro/Foliated metagabbro								Amphibolite		
Text. cont.	Mant. pseudomorph		As. g	As. pl	As. ilm	cpx pseudomorphs		cu exs	polygonal		
Sample	05-III-20	09-XII-8B	05-III-20	09-VIII-8A	09-VIII-8A	05-III-20	PNF 01A	PNF 01A	PNF 01B	PNF 01B	PNF 01B
Point	Hbl 5 9	Hbl 8.8c1	Hbl 1 1	Hbl 12 7	Hbl 9 1	Hbl 10 3	Hbl 4 2	Hbl 4 4	Hbl 1.1	Hbl 3.2	Hbl 3.5
SiO_2	44.87	40.58	41.65	39.85	43.01	52.77	47.72	53.36	41.82	43.12	49.26
TiO_2	0.79	1.52	0.99	0.53	1.72	0.26	0.84	0.22	0.67	0.58	0.25
Al_2O_3	11.24	13.46	14.10	16.92	11.93	3.36	7.66	1.33	13.61	12.10	5.70
FeO	16.74	19.40	17.82	19.6	19.07	13.29	18.12	26.07	17.28	17.24	14.04
MnO	0.21	0.19	0.15	0.29	0.26	0.21	0.12	0.35	0.25	0.28	0.28
MgO	10.49	8.03	8.62	6.88	8.71	15.52	11.51	14.96	9.96	10.70	14.75
CaO	11.44	11.27	11.34	11.15	11.18	12.00	10.95	2.50	11.97	12.20	12.37
Na_2O	1.19	1.63	1.50	1.71	1.61	0.43	1.13	0.16	1.08	1.08	0.52
K_2O	0.88	1.46	1.31	1.51	1.12	0.15	0.48	0.08	1.01	0.86	0.26
Total	97.84	97.56	97.48	98.47	98.626	98.014	98.546	99.075	97.65	98.20	97.43
Oxygens	23	23	23	23	23	23	23	23	23	23	23
Si	6.56	6.17	6.27	5.99	6.43	7.34	6.98	7.82	6.21	6.35	7.13
Ti	0.08	0.17	0.11	0.06	0.19	0.04	0.09	0.02	0.07	0.06	0.03
Al	2.02	2.41	2.50	3.00	2.10	0.87	1.32	0.23	2.38	2.10	0.97
Fe^{3+}	0.29	0.30	0.24	0.33	0.25	0.28	0.43	0.07	0.65	0.67	0.62
Mg	2.39	1.82	1.93	1.54	1.94	2.90	2.51	3.27	2.20	2.35	3.18
Fe^{2+}	1.68	2.17	2.00	2.14	2.14	1.60	1.78	3.13	1.49	1.46	1.08
Mn	0.03	0.02	0.02	0.04	0.03	0.02	0.01	0.04	0.03	0.03	0.03
Ca	1.88	1.84	1.83	1.80	1.79	1.84	1.72	0.39	1.90	1.93	1.92
Na	0.35	0.48	0.44	0.50	0.47	0.19	0.32	0.04	0.31	0.31	0.15
K	0.18	0.28	0.25	0.29	0.21	0.05	0.09	0.01	0.19	0.16	0.05
Total	15.46	15.66	15.59	15.69	15.55	15.13	15.25	15.02	15.43	15.42	15.16

In amphibolite samples, hornblende occurs both as polygonal aggregates and as rare pseudomorphs after clinopyroxene. The polygonal crystals may preserve chemical zoning, which can be of two types: actinolitic cores with pargasitic rims and pargasitic cores with actinolitic rims. The first type of zoning involves an abrupt compositional jump and has a greater overall compositional range, while the second involves more gradual and continuous compositional variation over a smaller range (Figure 3.4e). The actinolitic cores have ^{VI}Al between 0.05 and 0.16 apfu, ^{IV}Al between 0.8 and 1.0 apfu, $^{A}(Na+K)$ between 0.1 and 0.2 apfu and $Mg/(Mg+Fe^{2+}) \approx 0.75$. The other hornblende types have very similar compositions, with ^{VI}Al between 0.4 and 0.6 apfu, ^{IV}Al between 1.4 and 1.8 apfu, $^{A}(Na+K)$ between 0.35 and 0.45 apfu and $Mg/(Mg+Fe^{2+}) \approx 0.6$, with the pargasitic cores displaying just slightly higher ^{VI}Al, ^{IV}Al and $^{A}(Na+K)$ (Figure 3.10).

3.5.2 Plagioclase

Tabular plagioclase in metagabro is zoned: cores have composition between An_{50} and An_{68}, while rims have composition between An_{20} and An_{40}. This zoning is more pronounced near the rims (Figure 3.11). Recrystallized plagioclase in the metagabro samples displays more sodic compositions, between An_{20} and An_{40}. There is no compositional variation between analyses from different samples (Figure 3.12). Polygonal plagioclase from amphibolite may have anorthite contents as low as An_{15}, but most of the analyses show anorthite contents between An_{33} and An_{45}. Rare relict tabular grains display a chemical zoning similar to what is observed in the metagabro samples, from An_{62} to An_{38} (Figure 3.13).

3.5.3 Clinopyroxene

Clinopyroxene is usually diopside, with wollastonite contents near 45%, but some analyses show wollastonite contents as low as 30%. $Mg/(Mg+Fe^{2+})$ is 0.7 (Figure 3.14), and Na, Al and Ti contents are always low, less than 0.15, 0.3 and 0.1 apfu, respectively. There is no noteworthy chemical zoning within grains, and there are no compositional differences between crystals from different samples.

3.5.4 Garnet

Garnet compositions show no consistent variation with textural setting, with the exception of compositional zoning towards plagioclase grain boundaries. Almandine (60-65%) and grossular (15-20%) are the dominant end-members, with pyrope accounting for 9-11%, and spessartite varying between 2.5 and 7% (Figure 3.15). Chemical variation within

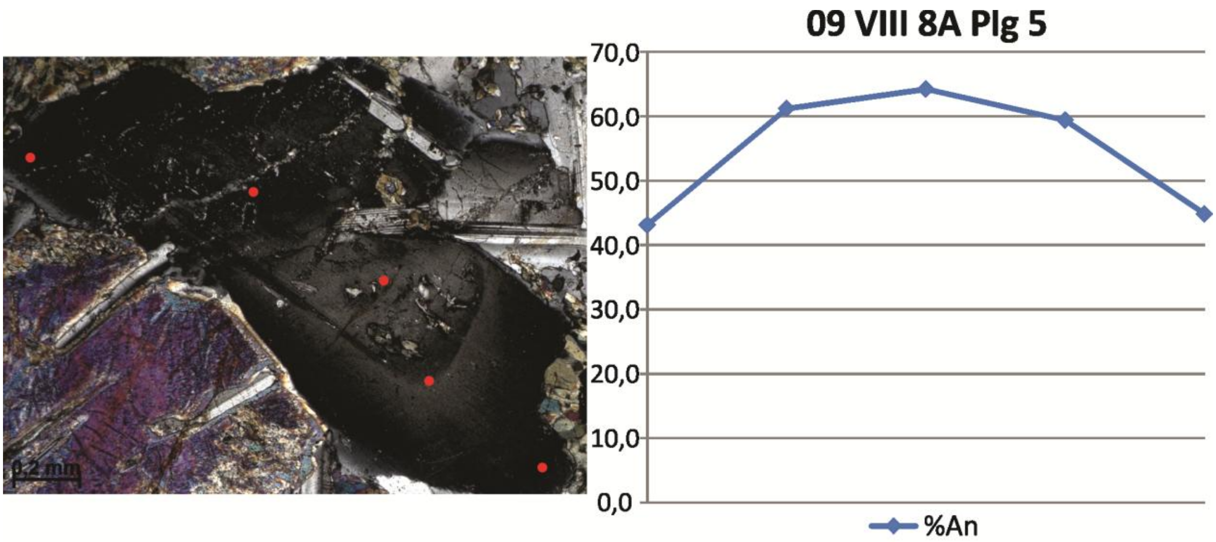

Figure 3.11. Chemical zoning in a plagioclase crystal from a metagabbro sample.

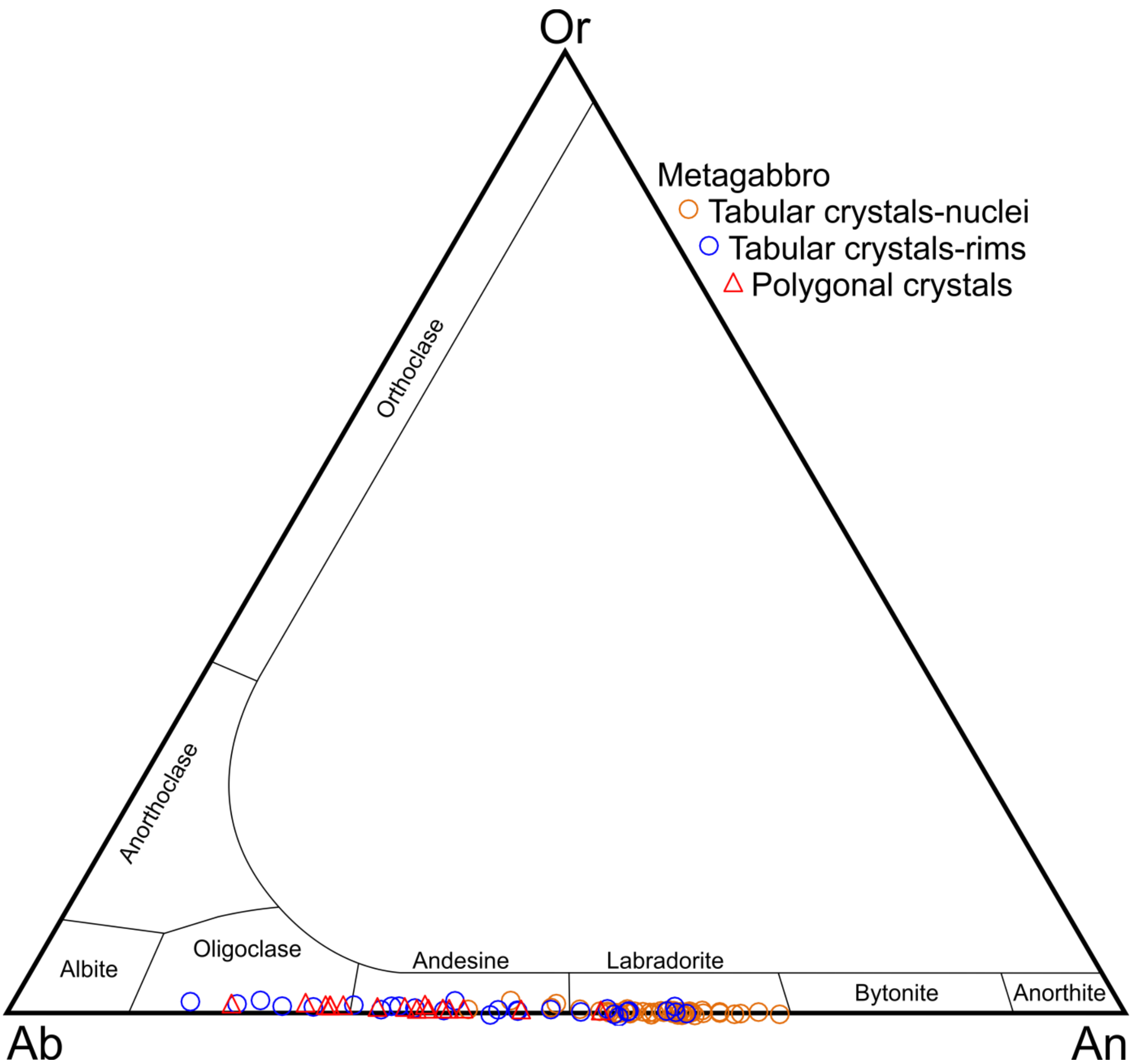

Figure 3.12. Chemical variation in plagioclase from metagabbro samples.

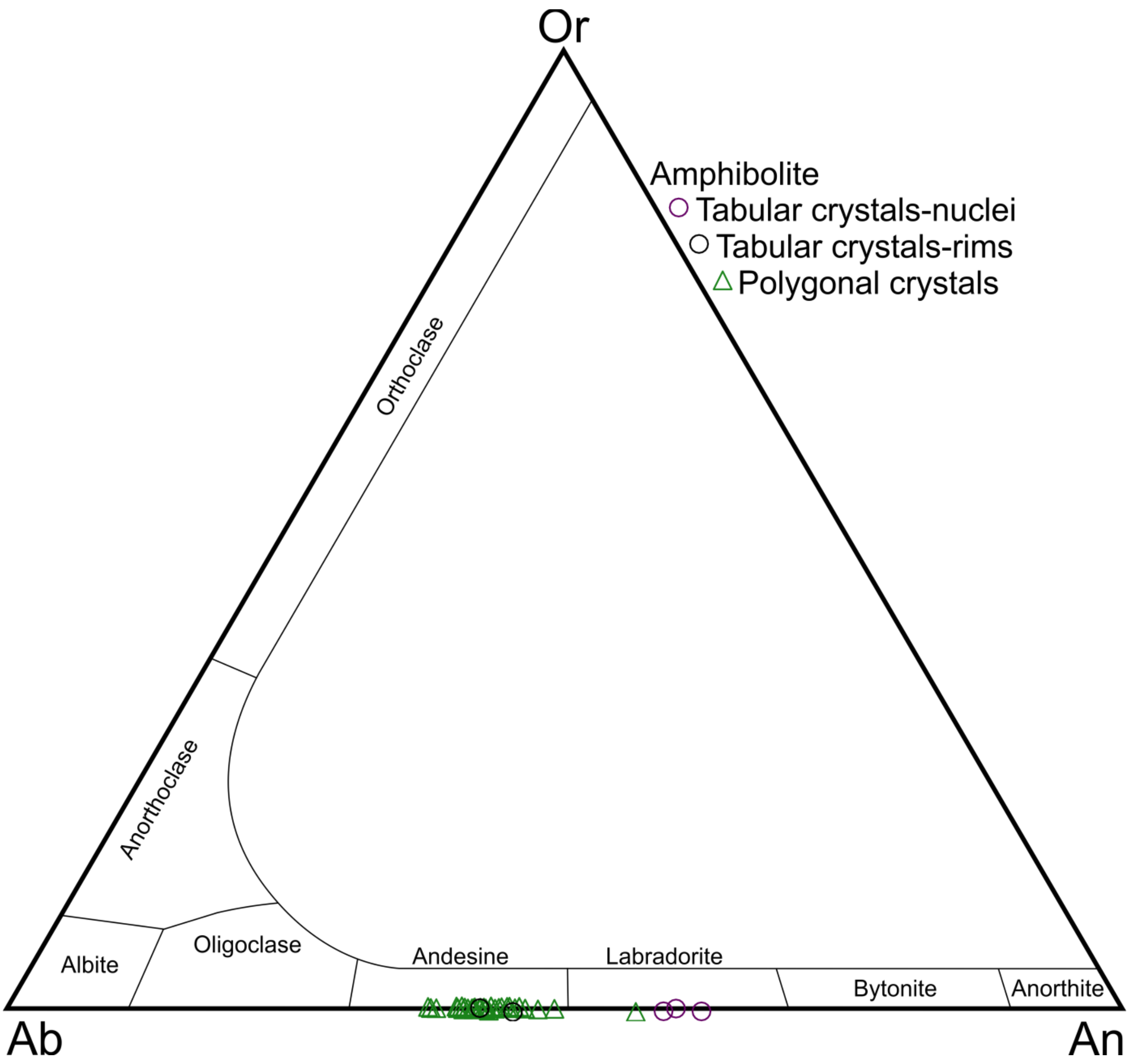

Figure 3.13. Chemical variation in plagioclase from amphibolite samples.

individual garnet crystals is a function of proximity to plagioclase, with Ca content being higher near plagioclase (Figure 3.16). Thus, garnet coronas between ilmenite and plagioclase exhibit a monotonic zoning of increasing grossular content towards plagioclase, coupled with decrease in the remaining components.

3.5.5 Biotite

Biotite crystals in the metagabbro have a uniform composition, with no significant differences between different samples or textural contexts. Total Al varies between 1.3 and 1.4 apfu, Si content is 2.7 apfu and $Mg/(Mg+Fe^{2+}) \approx 0.5$. Biotite crystals from amphibolite display very similar compositions, with total Al between 1.4 and 1.5 apfu and the same $Mg/(Mg+Fe^{2+})$ ratio and Si content (Figure 3.17).

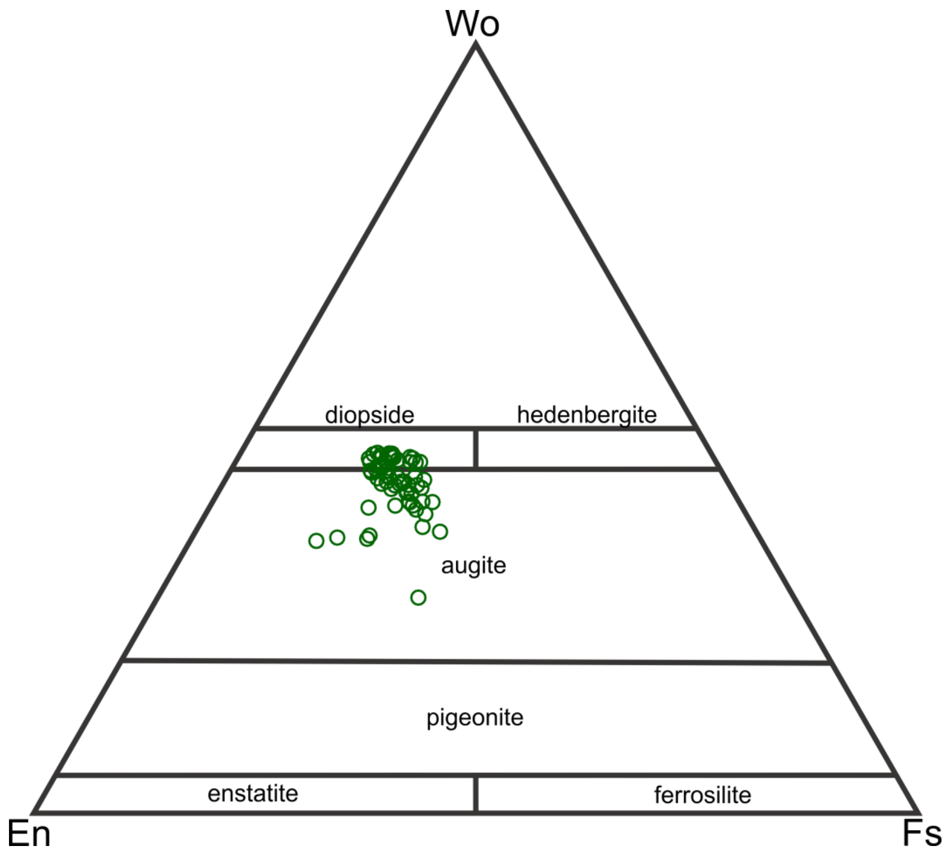

Figure 3.14. Chemical variation in clinopyroxene from metagabbro and foliated metagabbro samples.

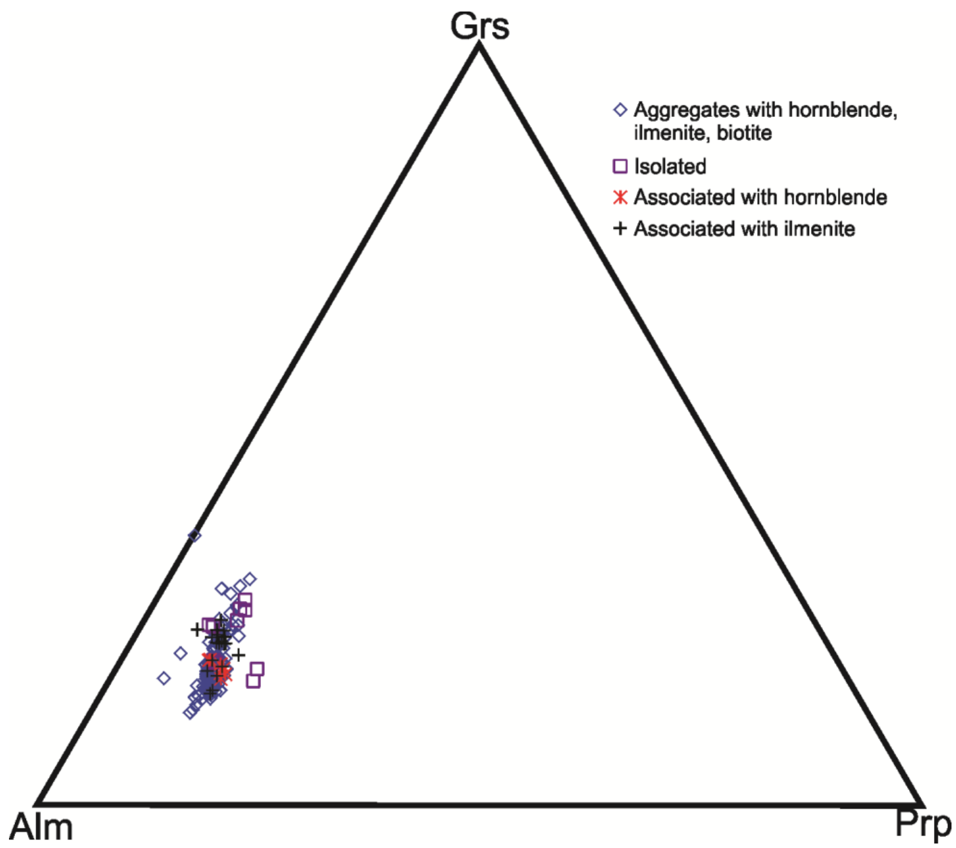

Figure 3.15. Chemical variation in garnet from metagabbro samples.

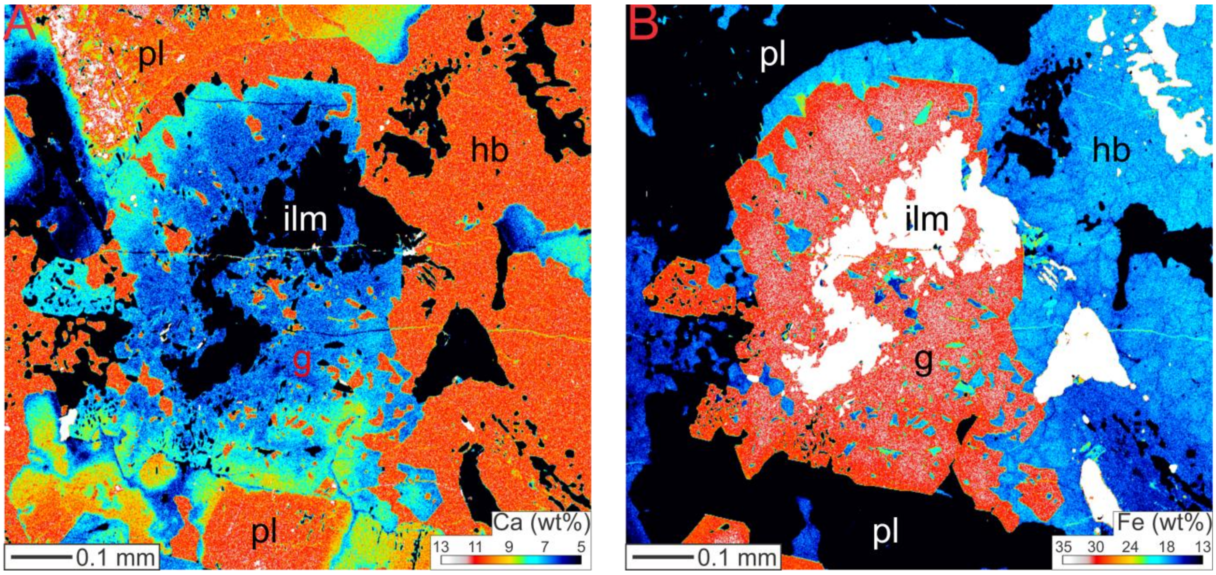

Figure 3.16. WDS compositional maps of a garnet crystal from a metagabbro sample, showing abundances of calcium (a) and iron (b).

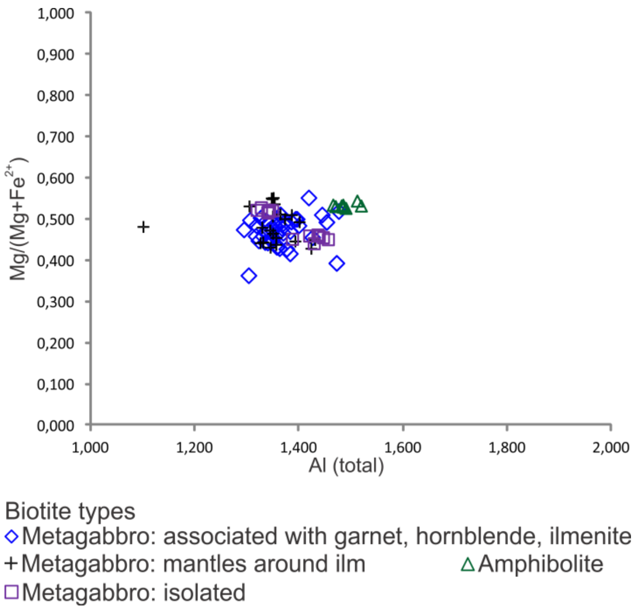

Figure 3.17. Chemical variation of biotite from metagabbro and amphibolite samples.

3.5.6 Ilmenite

Ilmenite in the studied rocks has almost ideal $FeTiO_3$ formula. Some crystals, however, present exsolution lamellae, whose compositions are intermediate between hematite and ilmenite (Figure 3.4c). The interpretation of this feature is that igneous ilmenite composition was also intermediary between ilmenite and hematite.

Table 3.3. Representative analyses of plagioclase from the study rocks. Abbreviations: *Text. cont.* - Textural context; *Tab.* - Tabular; *n.d.* - below detection limit; *n.a.* - not analyzed.

Mineral	Plagioclase									
Rock	Metagabbro/Foliated metagabbro						Amphibolite			
Text. cont.	Tabular-nuclei		Tabular-rims		Polygonal		Tab-nuclei	Tab-rims	Polygonal	
Sample	05-III-20	09-VIII-8A	05-III-20	09-VIII-8A	05-III-20	09-XII-8B	PNF 01B	PNF 01B	PNF 01B	PNF 01B
Point	Plg n8.1 c1	Plg 5 c2	Plg 8.1 b1	Plg 5 b1	Plg f3.1	Plg f4.3 c1	Plg 3 ln2	Plg 3 ln5	Plg 5.3	Plg 2.7
SiO_2	52.82	51.98	59.98	57.37	63.10	60.80	52.01	57.06	57.59	56.05
TiO_2	*n.d.*	0.07	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Al_2O_3	30.07	30.96	25.69	27.32	23.24	24.82	30.99	27.63	26.82	28.12
FeO	0.14	0.13	*n.d.*	0.17	0.08	0.18	*n.a.*	*n.a.*	*n.a.*	*n.a.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
CaO	12.26	13.10	6.93	8.83	3.98	6.00	12.52	8.59	7.78	9.24
Na_2O	4.37	3.98	7.44	6.33	9.03	7.87	4.28	6.54	7.11	6.19
K_2O	0.12	0.09	0.23	0.17	0.28	0.25	0.06	0.12	0.12	0.11
BaO	0.08	*n.d.*	0.05	*n.d.*	*n.d.*	*n.d.*	0.05	*n.d.*	*n.d.*	*n.d.*
SrO	0.08	0.06	0.08	0.08	0.09	0.12	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.80	100.31	100.31	100.23	99.73	99.97	99.96	100.13	99.50	99.81
Oxygens	8	8	8	8	8	8	8	8	8	8
Si	2.40	2.35	2.67	2.57	2.80	2.71	2.36	2.56	2.59	2.52
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.61	1.65	1.35	1.44	1.22	1.30	1.66	1.46	1.42	1.49
Fe^{2+}	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.60	0.64	0.33	0.42	0.19	0.29	0.61	0.41	0.38	0.45
Na	0.39	0.35	0.64	0.55	0.78	0.68	0.38	0.57	0.62	0.54
K	0.01	0.01	0.01	0.01	0.02	0.02	0.00	0.01	0.01	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	5.00	5.00	5.00	5.01	5.01	5.02	5.01

Table 3.4. Representative analyses of garnet and ilmenite from the studied rocks. Abbreviations: *Metg.* - Metagabbro/Foliated metagabbro; *Amph* - Amphibolite; *Text. cont.* - Textural context; *As.* - associated to a given mineral, *e.g.*: As g = associated to garnet; *n.d.* - below detection limit; *n.a.* - not analyzed.

Mineral	Garnet					Ilmenite	
Rock	Metagabbro/Foliated metagabbro					Metg.	Amph.
Text. cont.	As. ilm, hb, bt		Isolated	As. hb	As ilm	As. g, hb…	As. sph
Sample	05-III-20	09-XII-8B	09-XII-8B	PNF 01A	PNF 01A	09-XII-8B	PNF 01B
Point	Grt 4.1 c2	Grt 4 c2	Grt 5 c1	Grt 1.2nb2	Grt 5n c1	Opc 3.6 c1	Ilm 1.1
SiO_2	37.53	37.54	37.77	37.70	37.64	*n.d.*	*n.d.*
TiO_2	0.09	0.06	0.09	*n.d.*	0.06	51.95	53.14
Al_2O_3	20.66	20.47	21.01	20.67	20.56	0.02	*n.d.*
FeO	30.77	29.36	27.45	30.25	29.95	47.21	44.22
MnO	2.28	3.37	2.81	1.89	1.80	*n.d.*	2.51
MgO	2.57	2.37	2.34	2.74	2.68	0.25	0.22
CaO	6.99	7.22	9.20	7.23	7.57	0.06	*n.a.*
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.d.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.d.*	*n.a.*
Cr_2O_3	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.d.*	*n.d.*
Nb_2O_5	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.41	*n.a.*
Total	100.92	100.42	100.69	100.58	100.26	100.02	100.19
Oxygens	12	12	12	12	12	3	3
Si	2.97	2.99	2.98	2.99	2.99	0.00	0.00
Ti	0.01	0.00	0.01	0.00	0.00	0.99	1.00
Al	1.93	1.92	1.96	1.93	1.93	0.00	0.00
Fe^{3+}	0.12	0.09	0.07	0.08	0.09	0.01	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	1.92	1.86	1.74	1.92	1.91	0.99	0.93
Mn	0.15	0.23	0.19	0.13	0.12	0.00	0.05
Mg	0.30	0.28	0.28	0.32	0.32	0.01	0.01
Ca	0.59	0.62	0.78	0.61	0.65	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nb	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	2.00	1.99

Table 3.5. Representative analyses of clinopyroxene and biotite from the studied rocks. Abbreviations: *Text. cont.* - Textural context; *As.* - associated to a given mineral, *e.g.*: As g = associated to garnet; *n.d.* - below detection limit; *n.a.* - not analyzed.

Mineral	Clinopyroxene				Biotite					
Rock	Metagabbro/Foliated metagabbro				Metagabbro/Foliated metagabbro				Amphibolite	
Text. cont.	Mantled by hornblende		As. g, hb, ilm		As. ilm		Isolated		Isolated	
Sample	09-VIII-8A	09-VIII-8A	09-XII-8B	09-XII-8B	05-III-20	09-VIII-8A	05-III-20	05-III-20	PNF 01B	PNF 01B
Point	Cpx 4 b1	Cpx 4 c1	Cpx 1 c4	Cpx 2.2 c1	Bt1.1 c1	Bt5.1 c1	Bt 2.7 c1	Bt5.3 c1	Bt 1.1	Bt 2.3
SiO_2	51,25	51,60	52,28	52,30	35.94	35.80	35.66	35.82	35.81	35.66
TiO_2	0,11	0,22	0,06	0,07	3.74	4.27	4.11	4.05	2.19	2.09
Al_2O_3	1,14	0,98	0,58	0,55	15.35	15.03	14.95	14.77	16.43	16.53
FeO	12,18	11,81	10,00	10,37	19.69	21.85	19.57	19.09	19.56	19.29
MnO	0,40	0,44	0,34	0,34	0.07	0.07	0.06	0.09	0.17	0.17
MgO	11,46	11,60	12,77	12,60	10.78	9.22	11.30	12.00	12.43	12.43
CaO	21,98	21,89	23,04	22,80	0.05	0.06	0.05	0.04	0.00	0.00
Na_2O	0,39	0,40	0,30	0,30	0.06	0.11	0.11	0.08	0.08	0.08
K_2O	*n.d.*	*n.d.*	*n.d.*	*n.d.*	9.80	9.38	9.75	9.95	8.95	8.75
Cr_2O_3	0,12	0,19	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
ZnO	*n.d.*	*n.d.*	*n.d.*	0,04	*n.d.*	*n.d.*	*n.d.*	0.06	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.36	0.58	0.36	0.18	0.57	0.66
Total	99.04	99.14	99.38	99.38	95.89	95.84	95.59	95.97	95.64	95.04
Oxygens	6	6	6	6	11	11	11	11	11	11
Si	1,96	1,97	1,97	1,98	2.75	2.75	2.73	2.73	2.72	2.72
Ti	0,00	0,01	0,00	0,00	0.22	0.25	0.24	0.23	0.12	0.12
Al	0,05	0,04	0,03	0,02	1.38	1.36	1.35	1.33	1.47	1.48
Fe^{3+}	0,06	0,04	0,06	0,05	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0,00	0,01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0,33	0,34	0,26	0,28	1.26	1.40	1.25	1.22	1.24	1.23
Mn	0,01	0,01	0,01	0,01	0.00	0.00	0.00	0.01	0.01	0.01
Mg	0,65	0,66	0,72	0,71	1.23	1.06	1.29	1.36	1.41	1.41
Ca	0,90	0,89	0,93	0,92	0.00	0.01	0.00	0.00	0.00	0.00
Zn	0,00	0,00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na	0,03	0,03	0,02	0,02	0.01	0.02	0.02	0.01	0.01	0.01
K	0,00	0,00	0,00	0,00	0.96	0.92	0.95	0.97	0.87	0.85
Ba	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.02	0.02
Total	4.00	4.00	4.00	4.00	7.83	7.79	7.85	7.87	7.87	7.86

3.6. Thermodynamic Modelling

A series of pseudosections (Figures 3.18-3.21) was constructed using version 3.45 of THERMOCALC (Powell & Holland, 1988) and dataset ds62 (Holland & Powell, 2011, created February 6th, 2012). The activity-composition models used are those presented by White *et al.* (2014a) and Green *et al.* (2016) and references therein. Green *et al.* (2016) present two different clinopyroxene activity-composition models: the "omphacite model" takes into account order-disorder in M1 and M2 sites; and the "augite model" does not consider this order-disorder parameter, but allows Al in the T site and Fe^{2+} and Mg in the M2 site. The two models produce similar results in low-*T* greenschist and amphibolite facies conditions (Green *et al.*, 2016). The "omphacite model" is used in all calculations performed here.

P–T, P–X_{H2O} and T–X_{H2O} pseudosections were constructed for the composition of sample 02-IV-10A, a metagabbro. The *P-T* pseudosection was calculated taking H_2O as an excess phase, and, since this leads to unrealistic melt proportions (Droop & Brodie, 2012; Weinberg & Hasalova, 2015; White *et al.*, 2001), the *P-T*-pseudosection was calculated only up to the *solidus* curve, and no melt-bearing equilibria were calculated.

In order to define the $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ ratio to be used in the calculations, the Fe^{2+} content of sample 02-IV-10A was analyzed via wet chemical titration at the same laboratory were the FRX analyses were performed. This analysis results in an $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ ratio of 0.138. Since this result is likely to be an overestimation to some unknown degree (Diener & Powell, 2010), a lower value (0.11) was assumed. Moreover *P*– and T–$X(Fe^{3+}/(Fe^{3+}+Fe^{2+}))$ pseudosections were constructed for $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ ratios between 0.0 and the value obtained analytically (Figures 3.20, 3.21). They show that, although the assumed $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ ratio has an influence, especially over calculated pressures, this influence is significant only when the ratio approaches 0, what would be unrealistic.

The *P-T* pseudosection was calculated for the range 425–700 °C and 2–12 kbar (Figure 3.18). It presents a typical sequence of mineral assemblages, with greenschist facies conditions characterized by actinolite + epidote + albite + chlorite + sphene + quartz + biotite. As temperature increases, hornblende and plagioclase are introduced, while albite, actinolite and epidote are removed. Diopside becomes stable at $T \approx 500$ °C, but is restricted to pressures higher than 4 kbar for most of the covered *T* spectrum.

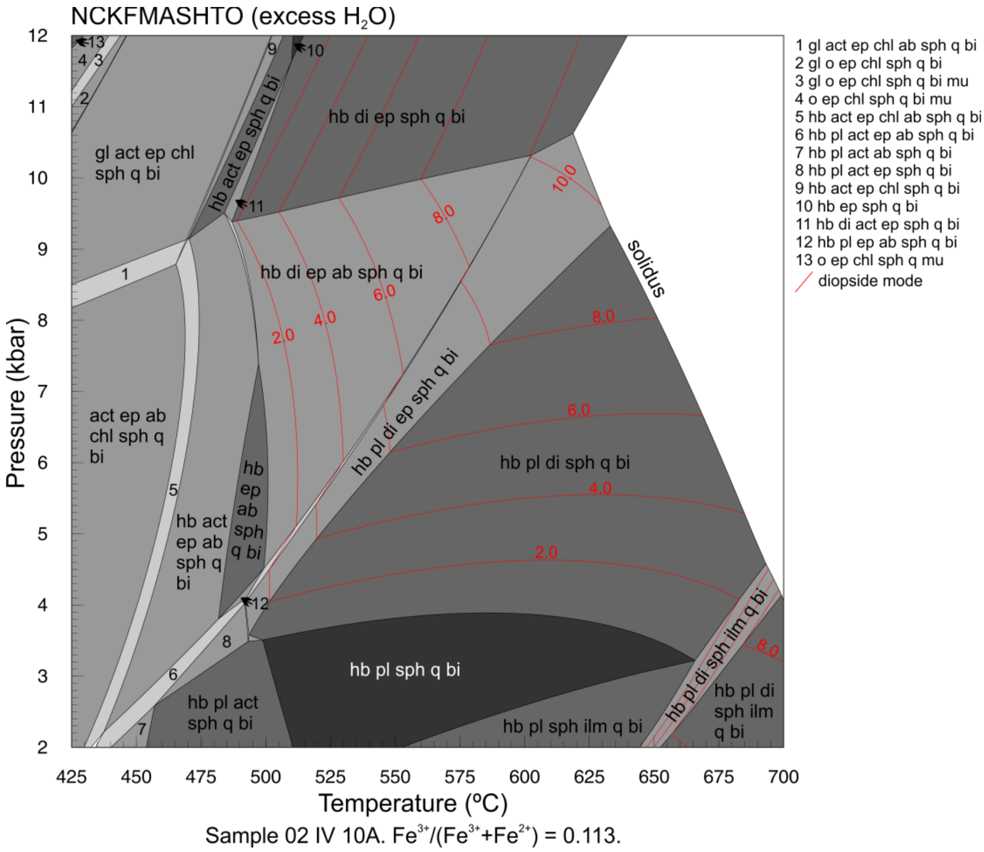

Figure 3.18. *P-T* pseudosection constructed for composition of sample 02-IV-10A. Mineral abbreviations according to Holland & Powell (2011), in all pseudosections.

Ilmenite replaces sphene as the Ti-bearing phase between 550 °C and 675 °C, depending on pressure. Glaucophane-bearing assemblages occur at pressures higher than ≈ 8.5 kbar and temperatures lower than 480 °C, while omphacite appears at pressures higher than ≈ 11 kbar at 425 °C. Garnet is not calculated to be stable in the covered range, and nor is rutile.

The assemblage observed in the amphibolites, *i.e.* hornblende + plagioclase + sphene + quartz + biotite, which is assumed to best represent the paragenesis, would be stable over a rather large *P–T* field, between 500 and 650 °C and pressures lower than 4 kbar, as at higher pressures it is limited by the diopside-in boundary. Diopside seems to become stable at too low *T*, what can be a result of small inaccuracies in the activity-composition models (*e.g.* Santos *et al.*, submitted-chapter 2, this volume; Forshaw *et al.*, in press). In any case, calculated diopside modes are low at most of the *P-T* spectrum considered (see mode contours in Figure 3.18).

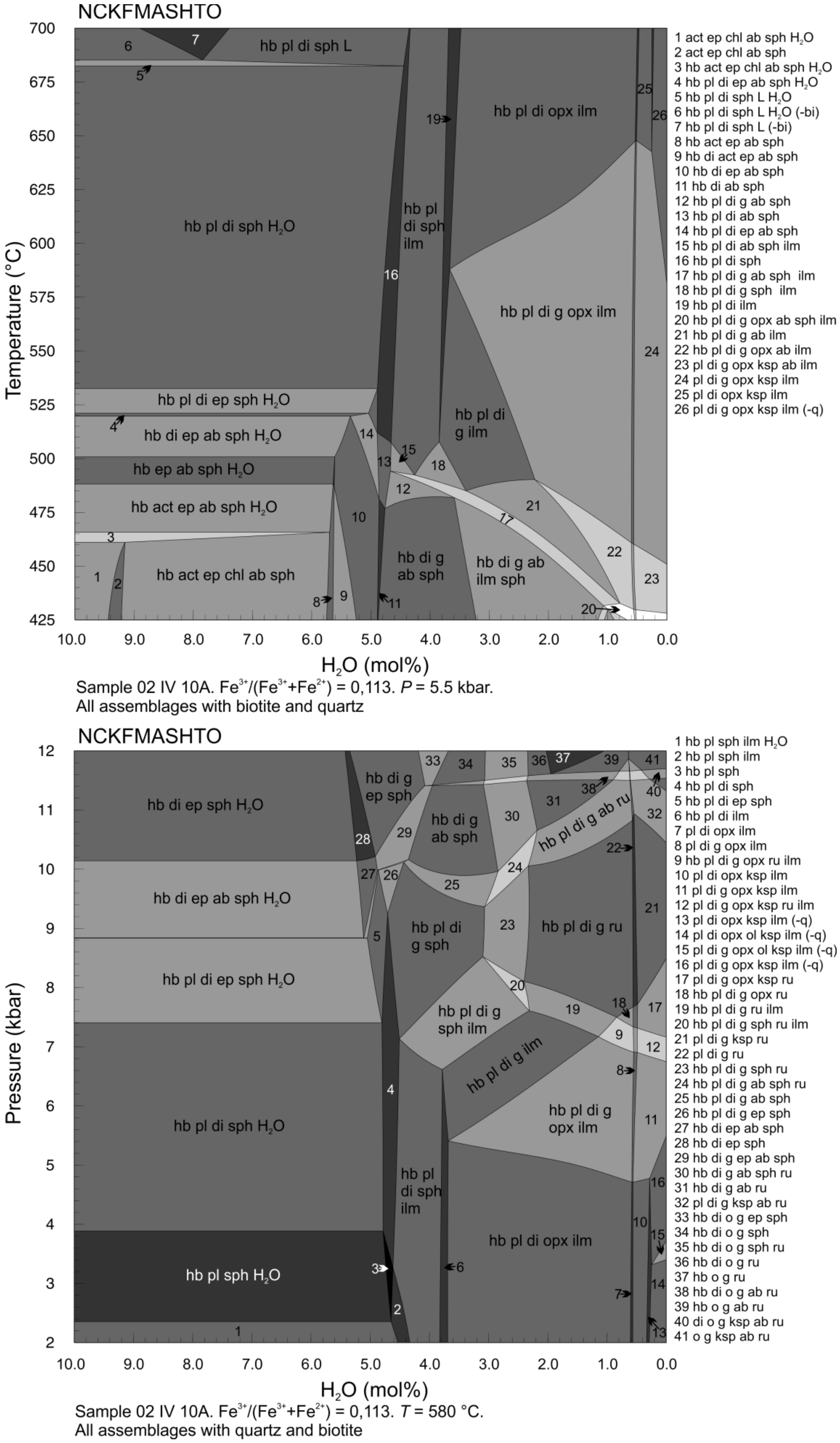

Figure 3.19. (a) *T*- X_{H_2O} pseudosection constructed for composition of sample 02-IV-10A. (b) *P*- X_{H_2O} pseudosection constructed for composition of sample 02-IV-10A.

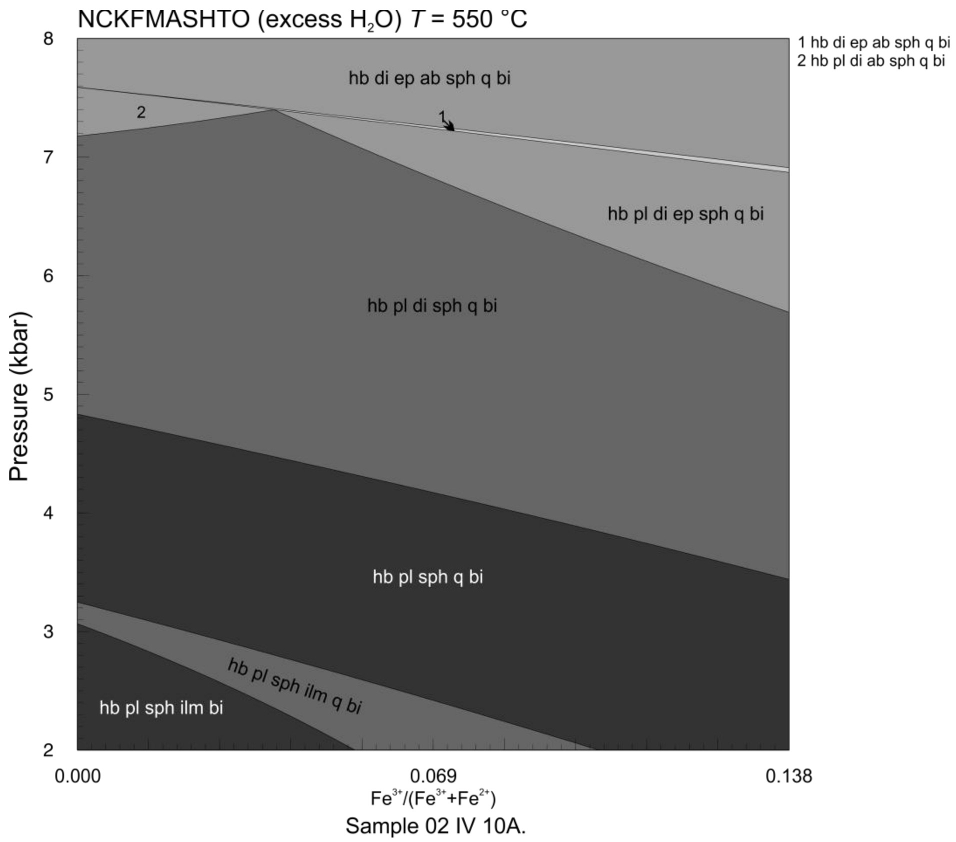

Figure 3.20. P-$Fe^{3+}/(Fe^{3+}+Fe^{2+})$ pseudosection calculated for composition of sample 02-IV-10A.

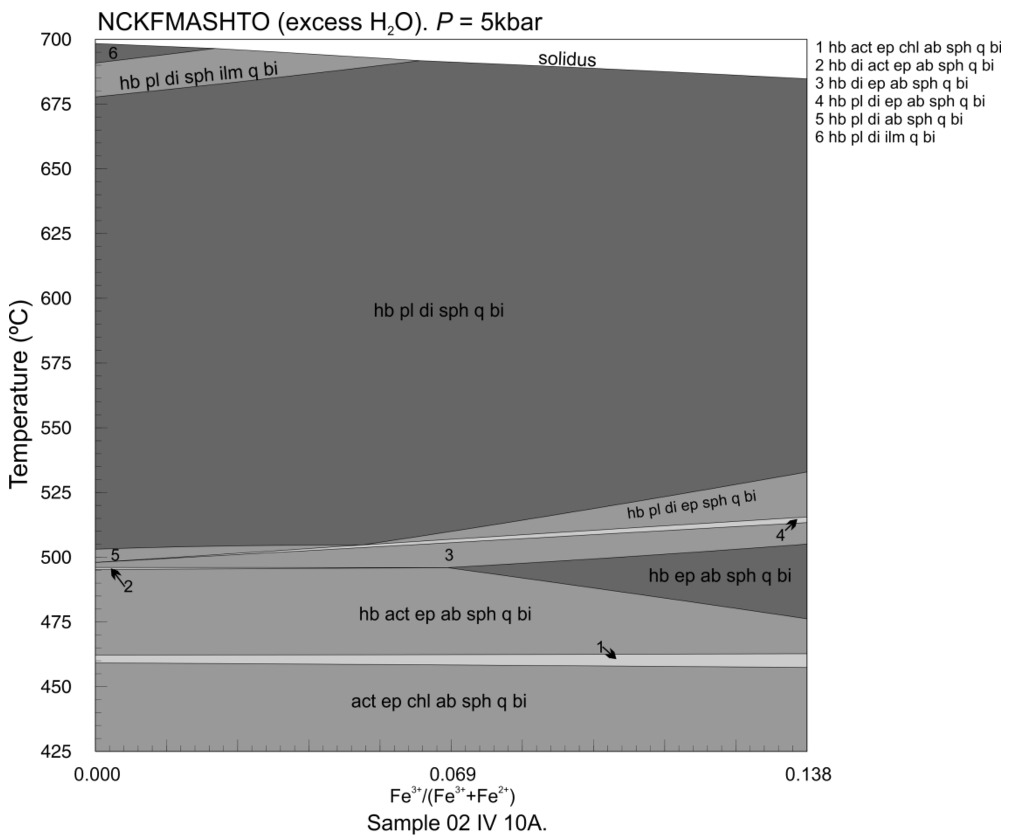

Figure 3.21. T-$Fe^{3+}/(Fe^{3+}+Fe^{2+})$ pseudosection calculated for composition of sample 02-IV-10A.

Calculated hornblende and plagioclase compositions agree with the compositions observed in the amphibolite in a region between 2 and 3 kbar and 500 and 560 °C, except for the calculated Mg/(Mg+Fe^{2+}) ratio of hornblende (0.52-0.53) which is lower than what is observed (0.6). This mismatch is likely caused by the presence, in the sample, of small quantities of ilmenite, summed with other remaining local equilibrium features and small differences in composition between this amphibolite and the modelled metagabbro composition.

T-X_{H2O}, and P-X_{H2O} pseudosections covering the H_2O range between 10.0 and 0.0 mol% were constructed for 5.5 kbar and 580 °C respectively, representing amphibolite facies conditions (Figures 3.19a, b). The low-H_2O limit was placed at the rather unrealistic condition X_{H2O} = 0.0 mol% in order to ensure that the relevant conditions would be covered.

The two pseudosections present the transition from typically metamorphic mineral assemblages at high H_2O contents to anhydrous ones, similar to those of the igneous protolith, even at low temperatures. In these pseudosections, hydrated minerals other than hornblende and biotite become unstable shortly after the system becomes unsaturated in H_2O, which occurs at H_2O contents of 5–6 mol% (Figures 3.19a, b). The pseudosections show that a decrease in the H_2O content leads to an increase in the stability field of diopside and decrease the stability field of sphene, which is replaced either by ilmenite or rutile at pressures lower or higher than ≈ 7 kbar, respectively (Figure 3.19b).

At X_{H2O} < 4.0–5.0 mol%, garnet and/or orthopyroxene become stable, with high pressures and low temperatures favoring garnet and the opposite favoring orthopyroxene (Figures 3.19a, b). Orthopyroxene stability may be less relative to Ca-free amphiboles (not modelled) and/or relative to garnet if MnO was additionally considered (*e.g.* Spear & Cheney, 1989; Symes & Ferry, 1992; Droop & Harte, 1995; Mahar *et al.*, 1997; White *et al.*, 2014b).

3.7. Discussion

In the case of H_2O-saturated conditions, typical amphibolite-facies metamafic rocks present the mineral assemblage hornblende + plagioclase + quartz ± biotite ± Ti-phase (Laird, 1980, Spear, 1981, Apted & Liou, 1983) and commonly display textures that reflect chemical equilibrium on a hand-sample scale. The metamafic rocks from the Mantiqueira Complex studied here show a wide range of metamorphic textures and mineral assemblages, ranging from moderately hydrated rocks with partially preserved igneous texture and mineralogy

(Figures 3.2a, b, 3.3 a-c, 3.4-3.7) to fully hydrated amphibolites with typical metamorphic textures and mineral assemblages (Figures 3.3c, 3.6a-d). These rocks present mineral and textural features that give insights into the nature of metamorphic transformation of igneous protoliths.

The main reaction textures observed consist of actinolitic hornblende pseudomorphs after clinopyroxene, mantled by pargasitic hornblende coronas, and garnet coronas around irregular-shaped ilmenite crystals, separating them from plagioclase or hornblende. The simplest explanation for this kind of texture is that they represent the arrested development of metamorphic reactions whose product is the mineral assemblage present in the fully hydrated counterparts of these rocks. However, this is not the case, as the equilibrium mineral assemblage in these counterparts is pargasitic hornblende + plagioclase + sphene + quartz, thus lacking garnet, and additionally containing sphene.

If the textures cannot be explained simply as products of reactions that result in the mineral assemblage found in the fully hydrated amphibolites, then another, more complex explanation must be invoked. Above, emphasis was put on the *kinetic* role of H_2O, as exemplified by fully *hydrated* samples being treated as fully *equilibrated*. However, H_2O is also a system component, whose quantity will affect phase relations, just like the other oxides.

The amount of H_2O likely varied in time and between and within samples, and such a variation must have the kinetic result of a variation in the equilibration volumes at different domains. This interplay between kinetics (the size of equilibration volumes) and thermodynamics (actual H_2O quantities) prevents the pseudosection approach from being quantitative, but, nonetheless, they allow X_{H_2O} effect to be accessed in a qualitative way. Both, P-X_{H_2O} and T-X_{H_2O} pseudosections (Figures 3.19a, b) show X_{H_2O} to have a strong effect on the stability of garnet, thus potentially explaining its presence in domains where low to moderately low amounts of H_2O were present. Importantly, high H_2O contents explain its absence in the amphibolites.

Besides the presence of garnet, the modelling also predicts rather large stability fields for clinopyroxene, ilmenite and orthopyroxene. As discussed above, there may be issues with the stability fields of orthopyroxene and clinopyroxene. Besides that, given the complex domainal nature of the metagabbro and foliated metagabbro, both preserving igneous relicts, it is expected that there would be differences between these samples and an equilibrium phase diagram calculated for the whole rock composition. Moreover, with such high variance assemblages preserved, small issues with the equilibrium compositions of the main phases (hornblende and plagioclase) may result in extra or missing phases in the calculations in order to allow mass balance.

While taking X_{H_2O} into consideration explains the overall presence or absence of garnet in the rocks, it does not explain the textural features. As discussed in several works (*e.g.* Joesten, 1977, Ashworth & Birdi, 1991, White *et al.*, 2008, White & Powell, 2011, Schorn & Diener, 2017) metamorphic processes can be seen as changes in P and T causing gradients in chemical potentials, which are in turn flattened by diffusion. If one or more components do not diffuse fast enough to readily flatten these gradients, they can influence the spatial organization of the rock, even if equilibrium across the considered length scale is ultimately achieved (Carmichael, 1969; White *et al.*, 2008, White & Powell, 2011).

Of the elements used to form the main silicates in metamorphic rocks, Al is commonly considered to be least mobile (*e.g.* Carlson, 2010; White *et al.*, 2008; Štípská *et al.*, 2010) and so is the most likely to influence texture development. The Al content is one of the defining differences between actinolitic and pargasitic hornblende and the spatial disposition of low-Al actinolitic hornblende that pseudomorphs clinopyroxene and high-Al pargasitic hornblende forming coronas between it (or clinopyroxene) and plagioclase is consistent with low Al mobility. From this, our interpretation of the clinopyroxene–amphibole textural relations is that initially pargasitic hornblende started forming coronas between clinopyroxene and plagioclase, and once clinopyroxene was separated from plagioclase (*i.e.* the Al source), it was replaced by actinolitic hornblende, as Al was insufficiently mobile. Over time, this actinolitic hornblende would be converted to pargasitic hornblende as the slow diffusion of Al continued. Some observed features contribute to this interpretation: pargasitic hornblende in places occurs in direct contact with clinopyroxene, indicating it could form before actinolitic hornblende. Furthermore, the zoning in Al content observed in hornblende crystals from foliated metagabbro samples illustrate the continuation of the process, with diffusion converting actinolitic hornblende crystals into pargasitic hornblende from the outside inwards (see Figures 3.7c, d). The other components involved in this conversion are Na, Fe^{2+} and Mg, but, of these, Na diffusion can be readily discarded as a controlling factor, since it is generally regarded as one of the most mobile elements (*e.g.* Santos *et al.*, in preparation-chapter 5, this volume) , and enters amphibole structure via coupled substitutions that involve Al. Fe^{2+} and Mg require more careful consideration, but features such as the presence of pargasitic hornblende along plagioclase grain boundaries indicate that Fe^{2+} and Mg were fairly mobile.

The mineral chemistry data obtained show the variation in Mg/(Mg+ Fe^{2+}) to be proportional to the variation in Al content (Figures 3.8-3.10), so Al mobility controls the texture development and compositional variation in hornblende.

Garnet spatial distribution can also be explained by low Al diffusion, since garnet always forms near plagioclase, the only Al-bearing mineral of the igneous assemblage, and appears to largely grow into it. Garnet most commonly forms coronas around ilmenite, and that cannot be explained by Al diffusivity alone, but such textures are not uncommon (*e.g.* White & Clarke, 1997). As ilmenite is Fe-rich, and also commonly one of the more Mn-rich minerals in rocks (Frost & Lindsey, 1991; White *et al.*, 2014b), it likely provides an ideal nucleation site for garnet (*e.g.* White & Clarke, 1997).

The present discussion explains mineralogical and textural features of the partially hydrated rocks, but does it bear importance to the development of the fully hydrated samples? In other words, did the amphibolites experience a stage correspondent to the metagabbro ? Or they evolved from gabbro in a different way? Textural features observed in the fully hydrated amphibolite point to the former answer, since actinolitic hornblende with pargasitic rims is still observed in these samples (Figure 3.3e), as is relict igneous tabular plagioclase. However, garnet is practically absent in the amphibolite, and no textural features point to its former presence, so the evolution of the different samples was similar, but not necessarily identical. Additionally, textural and mineral chemistry data show that the conversion of clinopyroxene to actinolitic hornblende and then pargasitic hornblende is not a simple one-stage process: the initially-formed pargasitic hornblende is "more pargasitic" than the equilibrium compositions measured in the amphibolite, and both amphibolite and foliated metagabbro samples present some crystals with the opposite zoning, representing the process of Al diffusing away from the initially formed high-Al crystals (see Figures 3.3e, 3.7).

Since clinopyroxene is one of the essential mineral phases of mafic igneous rocks, and pargasitic/tschermakitic hornblende is one of the essential mineral phases of amphibolite facies mafic rocks, the substitution process described here and the explanation given to it can likely be treated as general case for the metamorphism of gabbro/basalt at amphibolite facies conditions, under variable H_2O activity. The textures involving garnet may not be so general, though, as it is not clear if all samples did have garnet at some point of their evolution, and the control that factors such as bulk-rock composition, P, T and X_{H_2O} exert over garnet stability in mafic rocks need to be known more clearly.

3.8. Conclusions

Metagabbro samples from Mantiqueira Complex present a coherent picture of the transformation of gabbro to amphibolite, with changes in texture and mineral assemblage driven by deformation and H_2O ingress. The details of this transformation are recorded by the reaction textures developed in these rocks. The presence of garnet in the metagabbro and its absence from the amphibolite can be ascribed to the limited amount of H_2O that equilibrated with the mineral assemblage and is consistent with insufficient fluid present to saturate the mineral assemblage in the former. Other features, such as the presence of actinolitic hornblende pseudomorphs after pyroxene, the spatial distribution and chemical zoning in garnet, and the presence of hornblende in contacts between plagioclase grains can be ascribed to the low mobility of Al and, as secondary controlling element, Ca, in contrast to the higher mobility of other components, especially Fe and Mg. The initial partial replacement of clinopyroxene forming pargasitic hornblende coronas followed by its pseudomorphic replacement by actinolitic hornblende, and the subsequent conversion of actinolitic hornblende to pargasitic hornblende may be general features of the conversion from gabbro to amphibolite.

In many works, the amount of H_2O is not considered a controlling variable, be it because it is considered to be in excess (see examples in Spear, 1993; Bucher & Grapes, 2011 among others) or because it is present in very low quantities (*e.g* Ashworth *et al.*, 1998; Jamtveit *et al.*, 1990; Schorn & Diener, 2017). For the example here, H_2O plays a critical role not only as a kinetic factor, but also as a component whose quantity affects equilibrium relationships.

The persistence of igneous plagioclase and chemically zoned hornblende crystals even in the more hydrated, texturally equilibrated rocks, indicates that such medium-grained anhydrous rocks have difficulty in attaining thin section-scale chemical equilibrium even when subject to intense deformation and water influx.

3.9 References

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4 HIGH-PRESSURE MAFIC ROCKS FROM PASSOS NAPPE, SOUTHERN BRASILIA OROGEN: THE TECTONIC SIGNIFICANCE OF RETROECLOGITE OCCURRENCES IN SOUTHESTERN BRAZIL

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Abstract: The so-called retroeclogites from the region near São Sebastião do Paraíso (Southern Minas Gerais, Brazil) are rocks that occur as small bodies amidst high-grade metapelitic gneiss from the Araxá Group. They are dominated by garnet porphyroblasts over a matrix composed of clinopyroxene-plagioclase symplectite, and are traditionally interpreted as intensely retrogressed eclogites. In this work, a sample from one of the least retrogressed examples was studied, using petroghaphic analysis, mineral and whole-rock chemical analysis. These data were used as basis for thermodynamic modelling with THERMOCALC and for application of the Zr-in-rutile and Ti-in-zircon thermobarometers. By combining isopleths of Na in clinopyroxene with Zr-in-rutile and Ti-in-zircon data from crystals from the matrix and included in garnet, the maximum *T* experienced by the rock was constrained to be ≈ 730 °C, and the maximum *P* to be between ≈ 16 and ≈ 19 kbar. Even though different *P-T* paths can be drawn, these and additional constraints are suggestive of a clockwise *P-T* path. The obtained data does not support a subduction scenario for the formation of the retroeclogites. Furthermore, the data presented here do not support a *P-T* path that is substantially different from what was experienced by the surrounding and host gneiss, and, consequently a collisional tectonic setting is envisaged for the whole sequence.

Keywords: retroeclogite, pseudosection, trace-element thermometry

4.1 Introduction

In modern orogens, like the Alps, Andes and Himalaya, lenses or belts of high-*P* rocks are common, such as eclogites of Dora Maira, Italy (Schertl *et al.*, 1991), Noewegian Caledonides (Cuthbert *et al.*, 2000), Dabie Shan, China (Okay, 1993) and Diego de Almagro, Chile (Hyppolito *et al.*, 2016). Most of these occurrences are interpreted as pieces of ocean or continental crust that underwent subduction, and some are interpreted to have reached the mantle, as it is calculated that they have attained pressures as high as 30 kbar. Modern mathematical modelling has discussed the possibilities to generate eclogite facies rocks at the base of mountain belts (Jamieson *et al.*, 2004), but most of these rocks would, theoretically, underwent severe subsequent recrystallization under granulite or amphibolite facies and probably have their high-*P* record erased.

Such high-*P* rocks are still buried in most modern orogens, but the deep eroded precambrain orogenic belts are the best places to look for them. The Southern Brasília Orogen, SE Brazil, presents a large variation in metamorphic conditions, from very low grade to ultra high-temperature conditions, including lenses of high-pressure rocks (Campos Neto & Caby, 1999; Tedeschi *et al.*, 2016; Coelho *et al.*, 2017)). In the Passos Nappe, which is part of the Southern Brasília Orogen, retroeclogites are described since early 1980s (Hoppe *et al.*, 1985), as rocks constituted by hornblende, garnet, symplectites of clinopyroxene and plagioclase, rutile and secondary plagioclase and sphene. These rocks were recognized in several places within the Passos Nappe and some studies have tried to calculate their *P-T* conditions using conventional thermobarometry (*e.g.* Luvizotto, 2003).

Modern thermobarometric methods, such as thermodynamic modelling (Powell *et al.*, 1998; Green *et al.*, 2016) and trace-element thermobarometry (*e.g.* Zr-in-rutile: Zack *et al.*, 2004, Tomkins *et al.*, 2007; Ti-in-quartz: Wark & Watson, 2006, Thomas *et al.*, 2010) can now be used to study the metamorphism of the retroeclogite rocks, and, in fact, combinations of such methods have already been shown to be a robust approach to challenging metamorphic studies (*e.g.* Tedeschi *et al.*, 2017, Tual *et al.*, 2018). The main goal of this study is to use these new methods to investigate the metamorphism of the retroeclogites from the Passos Nappe, and its tectonic implications.

Along the text, reference to "peak" conditions and "peak" assemblage will often be made. In the context of this work, this expression denotes the *P-T* conditions at *maximum temperature*, and the mineral assemblage inferred to be present at these conditions.

4.2 Geological Setting

The study rocks occur amidst the Passos Nappe, a large structure that is part of the Southern Brasilia Orogen (Figure 4.1), which was formed during the Neoproterozoic by the collision between the São Francisco and Paranapanema cratons (Valeriano *et al.*, 2004a, b; Campos Neto *et al.*, 2004). The Passos Nappe comprises rocks from the Araxá Group, considered to have been deposited in deep sea and now represented by a thick sequence of schists, quartzites and gneisses. It presents an inverted metamorphic gradient, with biotite-chlorite-muscovite schist at the base, garnet-biotite-muscovite schist at intermediary portions and high-pressure, granulite facies, kyanite-garnet-K feldspar gneiss with migmatite features at the top (Teixeira & Danni, 1978; Simões *et al*., 1988; Simões, 1995; Luvizotto, 2003). *P-T* conditions near São Sebastião do Paraíso, were determined as 550 °C and 7 kbar, for Unity D (biotite-muscovite gneiss and muscovite schists), and 800 °C and 14 kbar, for Unity H (kyanite-garnet migmatitic gneiss) by Luvizotto (2003).

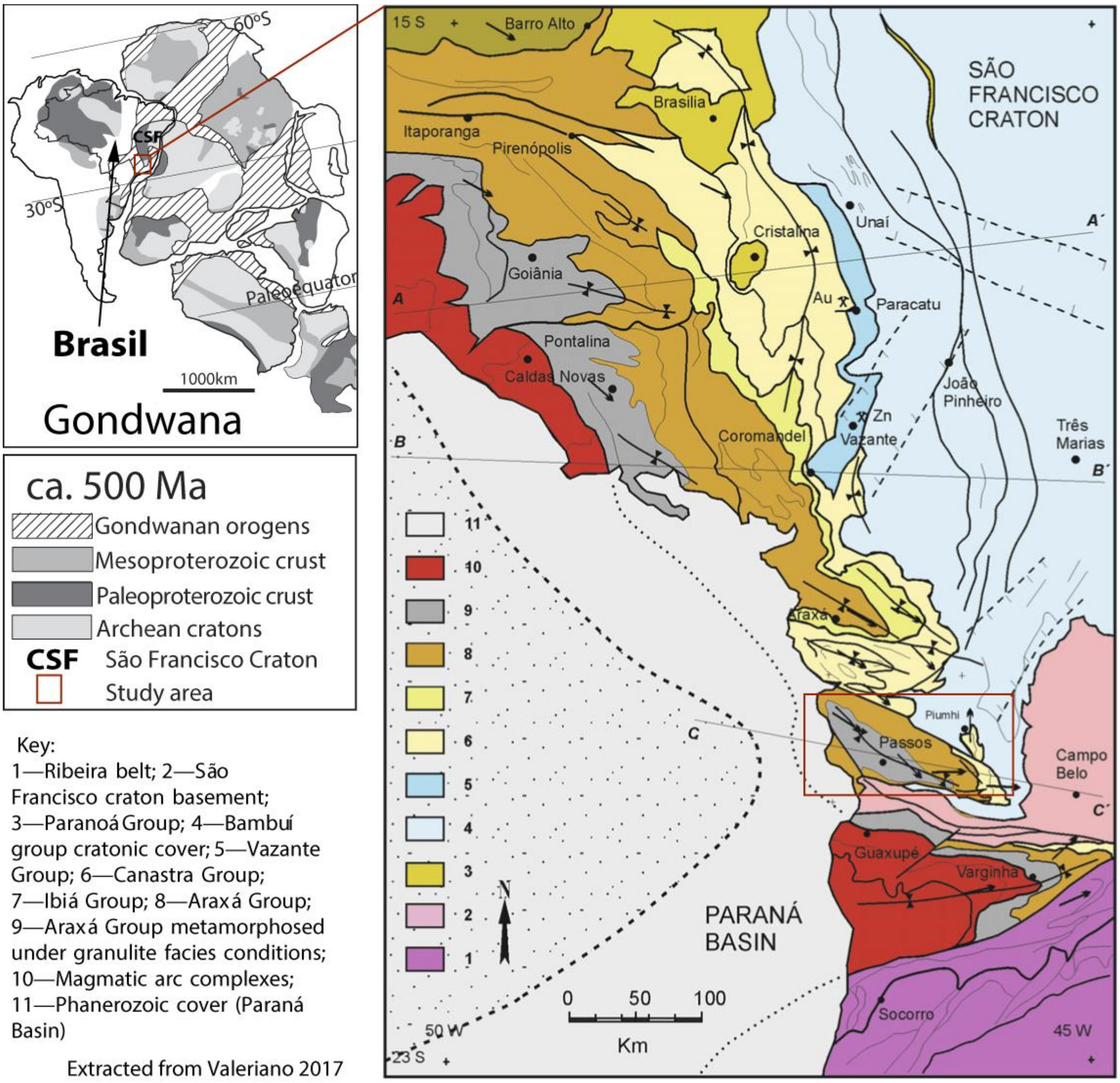

Figure 4.1. Tectonic map of Southern Brasilia belt and adjoining southwestern margin of the São Francisco craton (Extracted from Valeriano, 2017), showing the locations and geological context of the study area.

Valeriano *et al.* (2004b) dated detrital zircon and monazite crystals and obtained paleoproterozoic to mesoproterozoic ages, and interpreted the Araxá Group as a passive margin sequence from São Francisco Craton (see also Pimentel *et al*., 2011).

The mafic rock studied here is a garnet-clinopyroxene-hornblende fels, originally described by Hoppe *et al.* (1985) and classified as retroeclogite, *i.e.* eclogite intensily affected by retrometamorphism. The same interpretation is given to other broadly similar occurrences along the Southern Brasilia Orogen (*e.g.* Choudhuri *et al.*, 1978; Luvizotto, 2003; Coelho *et al.*, 2017) but this interpretation was recently challenged by Tedeschi *et al.* (2017) who worked with occurrences near Pouso Alegre (Southern Minas Gerais State, southeast from the occurrences studied here) and interpreted these occurrences as high-pressure amphibolites.

Luvizotto (2003) documented several occurences of garnet-clinopyroxene amphibolite that have a distinct texture, where coronas of plagioclase and amphibole are formed around garnet, isolating the latter from the clinopyroxene that forms symplectitic intergrowth with plagioclase. The sample studied here, in particular, comes from an occurrence surrounded by high-pressure migmatites that comprise the Unity F of Luvizotto (2003). In this contribution, we focused specifically in one occurrence, which is the one considered to be the least affected by retrograde reactions.

4.3 Geochemistry

One sample of this rock was analyzed at the Chemistry and X-ray Fluorescence Laboratory of the NAP Geoanalítica - Institute of Geosciences, University of São Paulo, Brazil, using a PANalytical AXIOS MAX spectrometer. Analyses were performed on fused glass discs, according to the procedures described by Mori *et al.* (1999). It plots on the basalt field of the TAS diagram of Le Maitre *et al.* (1989), with SiO_2 ≈ 50%, Al_2O_3 ≈ 13%, CaO ≈ 12% and MgO ≈ 8% (Table 4.1).

Table 4.1. Whole-rock chemical composition of the study sample. Values in wt %.

Sample	SPF 03A
SiO_2	49.56
TiO_2	1.33
Al_2O_3	13.05
FeO	8.65
Fe_2O_3	4.83
MnO	0.20
MgO	7.87
CaO	11.94
Na_2O	1.78
K_2O	0.06
P_2O_5	0.11
Total	99.38

4.4 Petrography

The rocks studied here (sample SPF-03A) correspond to coarse-grained hornblende-garnet-clinopyroxene fels, with decussate to weekly oriented texture. It presents millimetric garnet porphyroblasts (≈35%) and millimetric hornblende (≈25%) and quartz (≈6%) aggregates (Figure 4.2a), over a matrix formed by clinopyroxene-plagioclase symplectites (≈30%). Rutile is a common accessory, apatite, sphene and opaque minerals occur rarely.

The symplectites can be divided in two textural types. One is composed of irregular-shaped, millimetric to submillimetric, clinopyroxene crystals intergrown with worm-like, micrometric plagioclase crystals (Figure 4.2b). In the second type, the area density of intergrowths is smaller and the plagioclase intergrowths are more rectilinear in shape (Figure 4.2b). The two types occur together, generally with irregular contacts between them.

Garnet usually is separated from the symplectites by a double corona composed by an inner layer of plagioclase and an outer layer of hornblende (Figure 4.2c). Garnet crystals are rich in inclusions, mainly quartz, but also rutile, hornblende, plagioclase and opaque minerals.

Both the hornblende and quartz aggregates are irregular in shape. Hornblende crystals are subidioblastic, and the aggregates include interstitial plagioclase. Hornblende can also occur as patches in clinopyroxene, in textures that suggests replacement (Figure 4.2d). Rutile crystals, both in matrix and as inclusion in garnet, can be mantled by sphene.

Textures such as coronas and symplectites suggest chemical disequilibrium at thin section scale. Plagioclase intergrowths in clinopyroxene indicate that this mineral was at some point richer in Na. Plagioclase occurrence in the study rock is always linked to such disequilibrium textures. Given these factors, our interpretation is that, at peak conditions, the rock was composed by garnet, clinopyroxene (which was richer in Na than it is now) and rutile, with neither plagioclase nor sphene, and that these minerals formed in the retrograde trajectory, likely at H_2O-undersaturated conditions, thus the prevalence of disequilibrium textures.

The role of hornblende is harder to access. Coronas around garnet are certainly retrograde features, but the aggregates of subidioblastic crystals do not have an evident interpretation. It is plausible that hornblende (*lato sensu*) was part of the original assemblage and changed composition, but it can also be that part of it (not only the coronas) is retrograde, or it can be all retrograde. The presence of interstitial plagioclase in the hornblende aggregates may be an indication that at some point hornblende was richer in Na, as would be expected for broadly high-P conditions. More on this topic later in the text.

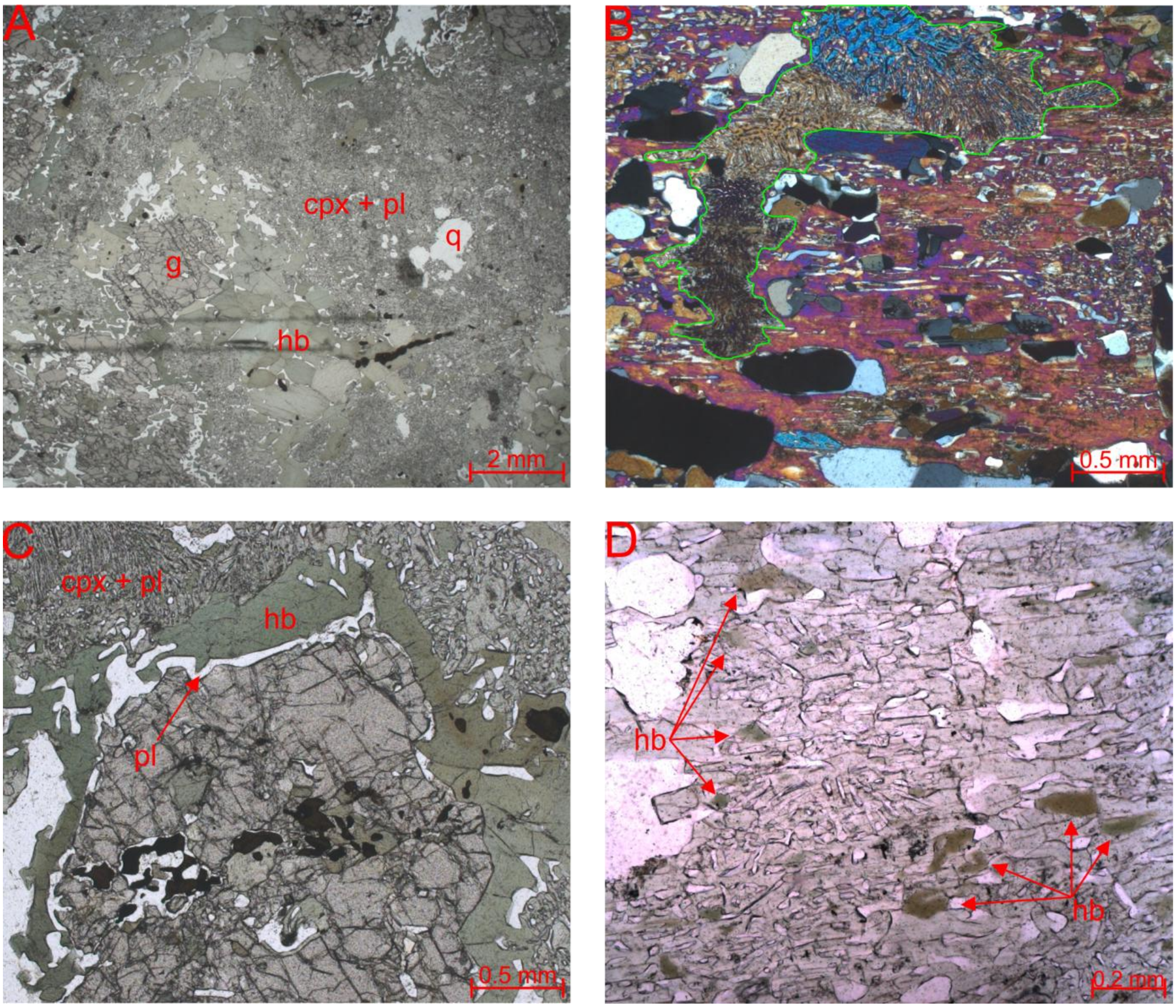

Figure 4.2. (a) General aspect of the rocks from sample SPF 03A on the microscope. (b) Two generations of clinopyroxene-plagioclase symplectite in sample SPF 03A. The green line marks the outline of a portion richer in plagioclase intergrowths against a section which is poorer in plagioclase intergrowths. (c) Garnet crystal with a double corona composed of plagioclase and hornblende in SPF 03A. (d) "Patches" of hornblende substituting clinopyroxene in SPF 03A.

4.5 Mineral Chemistry

Mineral chemistry analyses were obtained at the Electron Microprobe Laboratory of the NAP Geoanalítica - Institute of Geosciences, São Paulo University, Brazil, using a JEOL JXA-FE-8530. The analyses were carried on using 15 kV acceleration voltage and 20 nA probe current, beam diameter of 5 µm for all minerals. A range of synthetic and natural mineral standards was employed for element calibration. Structural formulae were calculated using spreadsheets constructed with the software Microsoft Excel. For clinopyroxene and garnet, Fe^{3+} was estimated using the method described by Droop (1987), while for amphiboles the method of Schumacher (described in Leake *et al.*, 1997) was used instead. Representative analyses are shown in tables 4.2-4.4.

WDS compositional maps for all major oxides, plus TiO_2, MnO and Cr_2O_3, were obtained in an area that includes a garnet crystal, the corona surrounding it, and the clinopyroxene-plagioclase symplectite. The data were obtained at the Electron Microprobe Laboratory of Institute of Geosciences and Exact Sciences of São Paulo State University (UNESP, Rio Claro), using a JEOL JXA 8230 electron microprobe. Ancillary quantitative analyses were obtained with an acceleration voltage of 15 keV and current of 20 nA. The X-ray WDS maps were collected using 15 keV, 100 nA, 200 to 300 msec dwell times and resolution between 1 and 10 µm. Phase and concentration maps were constructed using the software XMapTools 2.4.3 (Lanari *et al.*, 2014).

4.5.1 Clinopyroxene

Most analyses plot on the diopside field, and some plot on the omphacite field. Na contents are mostly between 0.05 and 0.2 apfu, going as high as 0.24 apfu. $Mg/(Mg+Fe^{2+})$ are between 0.8 and 0.9. Crystals from the two types described above differ in their Na content, as the type with less plagioclase intergrowths displays higher Na content (Figure 4.3). Furthermore, it can be seen from point analyses and compositional map that higher-Na areas are irregular (Figures. 4.4a and 4.4b), and tend to occur in the larger clinopyroxene segments. An attempt was made to reconstruct the peak clinopyroxene composition from the symplectite composition. This was made by integration of pixel composition in the symplectite domain in the compositional map (Figure 4.4b), after a density correction (Lanari & Engi, 2017). The reconstructed formula, calculated from the reconstructed composition is $Na_{0.19}Ca_{0.72}Fe^{2+}{}_{0.2}Mg_{0.58}Al_{0.27}Al_{0.03}Si_{1.96}O_6$.

4.5.2 Garnet

Garnet composition vary little, with almandine between 50% and 55%, pyrope between 20% and 25%, grossular between 20% and 30% and spessartite <5.5% (Figure 4.5). Crystals present no pattern of chemical zoning (Figure 4.4).

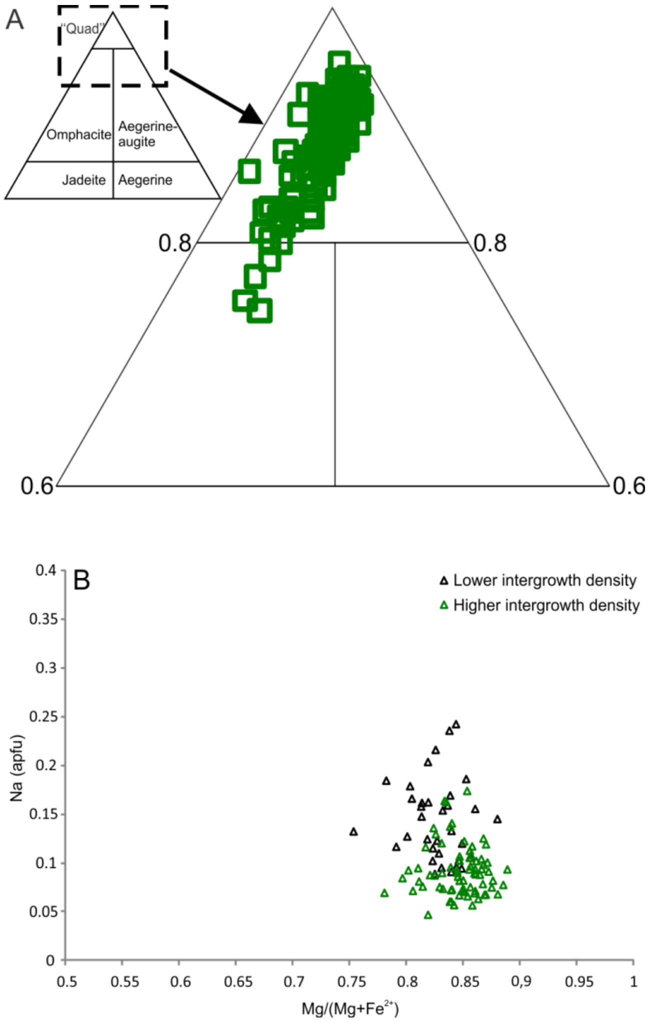

Figure 4.3. Clinopyroxene mineral chemistry data, shown as a plot on the sodic pyroxene tetrahedron (a) and as a Na versus $Mg/(Mg+Fe^{2+})$ plot (b)

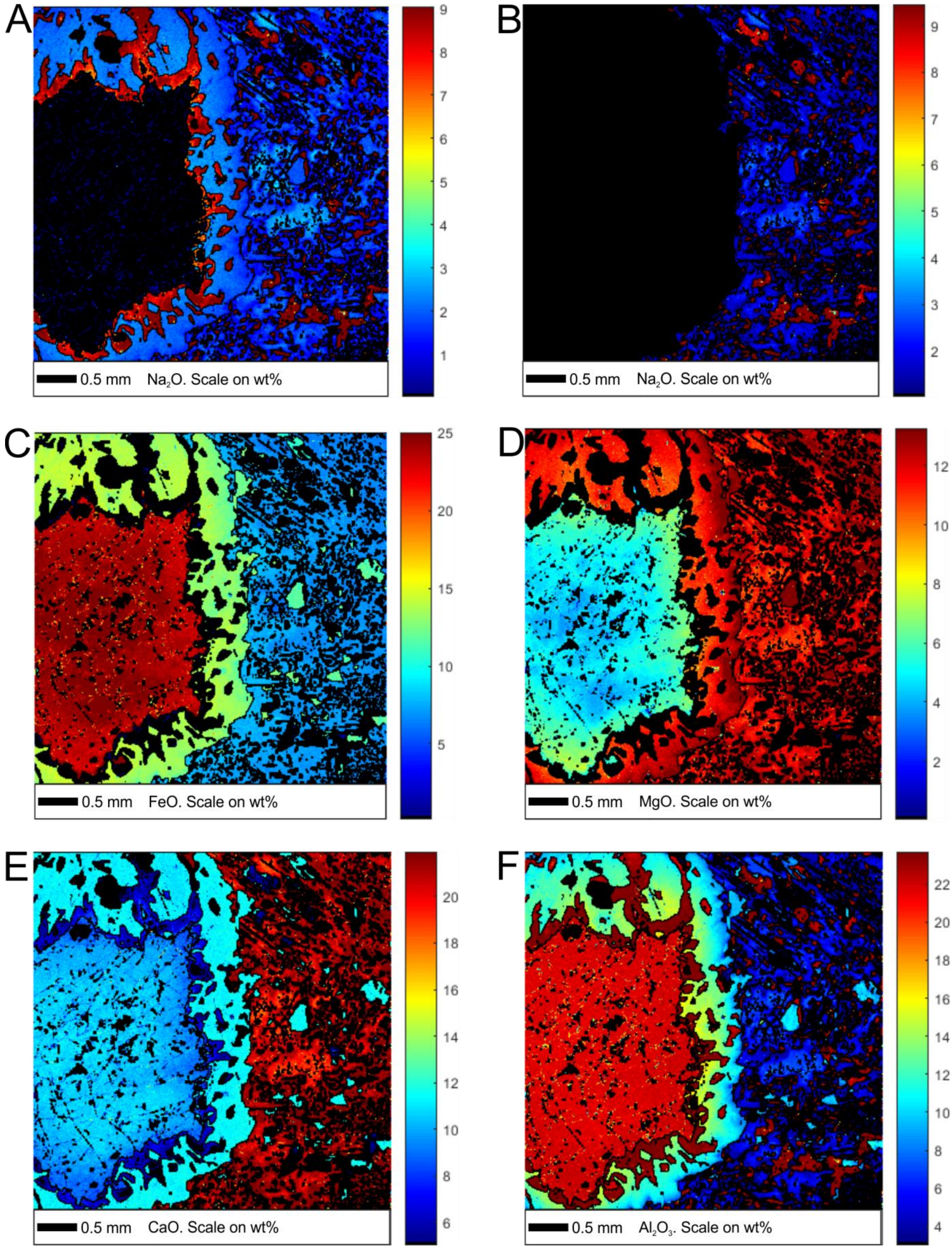

Figure 4.4. Compositional maps obtained for a region containing a garnet crystal, the corona surrounding it and clinopyroxene-plagioclase symplectite. (a) Na_2O map. (b) Another Na_2O, showing just the region used for reintegration of clinopyroxene composition. (c) FeO map. (d) MgO map. (e) CaO map. (f) Al_2O_3 map.

Table 4.2. Representative analyses of clinopyroxene and garnet from the study sample. Abbrviations: *Text. cont.* - textural context; *low intrg* - low area density of intergrowths; *high intrg* - high area density of intergrowths; *porphybl* - porphyroblasts; *n.d.* - below detection limit; *n.a.* - not analyzed.

Mineral	Clinopyroxene				Garnet		
Text.cont.	high intrg	high intrg	low intrg	low intrg	porphybl	porphybl	porphybl
Point	Cpx 2.4	Cpx 2.6	Cpx 5.15	Cpx 6.13	Grt 2.5	Grt 3.13	Grt 4.7
SiO_2	52.13	52.24	52.23	53.20	38.82	37.80	38.90
TiO_2	0.10	0.08	0.11	0.13	0.07	0.06	0.05
Al_2O_3	4.25	2.19	4.95	6.75	22.07	21.59	21.89
FeO	7.60	7.41	7.22	6.69	23.90	24.62	22.74
MnO	0.05	0.07	0.07	0.06	0.25	0.80	0.50
MgO	12.52	13.60	12.32	11.24	5.65	5.41	5.61
CaO	20.80	22.16	21.00	18.46	9.85	8.52	10.69
Na_2O	1.80	1.13	1.62	3.44	*n.a*	*n.a*	*n.a*
K_2O	0.01	*n.d*	*n.d*	0.00	*n.a*	*n.a*	*n.a*
Cr_2O_3	0.04	*n.d*	0.01	0.12	0.09	0.02	*n.d.*
Total	99.30	98.89	99.54	100.09	100.70	98.82	100.38
Oxygens	6	6	6	6	12	12	12
Si	1.93	1.95	1.93	1.93	2.98	2.97	2.99
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	0.19	0.10	0.22	0.29	2.00	2.00	1.98
Fe^{2+}	0.15	0.13	0.18	0.11	1.50	1.56	1.43
Mn	0.00	0.00	0.00	0.00	0.02	0.05	0.03
Mg	0.69	0.76	0.68	0.61	0.65	0.63	0.64
Ca	0.82	0.88	0.83	0.72	0.81	0.72	0.88
Na	0.13	0.08	0.12	0.24	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Fe^{3+}	0.09	0.10	0.04	0.09	0.03	0.06	0.03
Total	4.00	4.00	4.00	4.00	8.00	8.00	8.00

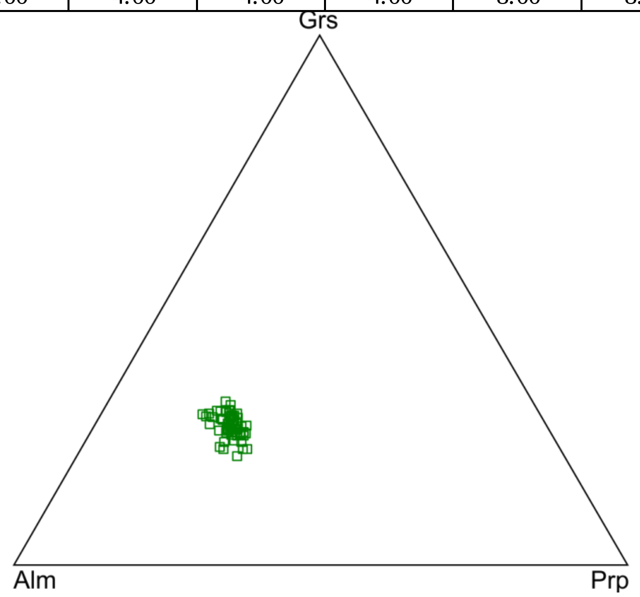

Figure 4.5. Garnet mineral chemistry data. Vertices of the tri-plot are the normalized proportions of almandine, grossular and pyrope.

4.5.3 Hornblende

Hornblende compositions show correlation with texture. Hornblende that occur in textures that suggest clinopyroxene substitution have ^{VI}Al between 0.2 and 0.6 apfu, ^{IV}Al between 1.1 and 1.6 apfu, $^{A}(Na+K)$ between 0.4 and 0.6 apfu, $Mg/(Mg+Fe^{2+})$ between 0.7 and 0.8, ^{B}Na between 0.06 and 0.15 apfu and Ti between 0.03 and 0.15 apfu (Figure 4.6). Crystals from hornblende aggregates and from coronas around garnet porphyroblasts are similar in terms of ^{IV}Al (1.0-2.2 apfu), $^{A}(Na+K)$ (0.4-0.75 apfu) and ^{B}Na (0.06-0.16 apfu) but differ slightly in terms of ^{VI}Al (0.4-0.8 apfu and 0.25-1.0 apfu, respectively); $Mg/(Mg+Fe^{2+})$ (0.7-0.83 and 0.65-0.75, respectively) and Ti up tp 0.09 apfu and up to 0.18 apfu, respectively (Figure 4.6). Most crystals included in garnet porphyroblasts display compositions in the middle of the range of the crystals in coronas, but there are abnormal compositions with higher ^{B}Na, up to 0.22 apfu, and other crystals with higher $^{A}(Na+K)$ and ^{IV}Al combined with regular ^{VI}Al and low $Mg/(Mg+Fe^{2+})$ (Figure 4.6. 4.8). Subidioblastic crystals may show a slight zoning, with higher ^{IV}Al, ^{VI}Al, and $^{A}(Na+K)$ and lower $Mg/(Mg+Fe^{2+})$ at rims. Hornblende from coronas display chemical zoning, with higher total Al and $^{A}(Na+K)$ and lower $Mg/(Mg+Fe^{2+})$ towards garnet (see Figure. 4.4f).

4.5.4 Plagioclase

Plagioclase intergrown with clinopyroxene presents anorthite contents between 17 and 27 %, while plagioclase from coronas around garnet present anorthite contents between 20 and 31 %. Plagioclase interstitial in hornblende aggregates is relatively sodic, with anorthite contents between 17 and 21 % (Figure 4.7).

Plagioclase coronas around garnet are zoned, with inner parts richer in Na and the outer parts (both, towards garnet and towards hornblende) richer in Ca (Figures 4.4a, 4.4e). Regarding the different types of clinopyroxene, no compositional difference in the associated plagioclase was detected.

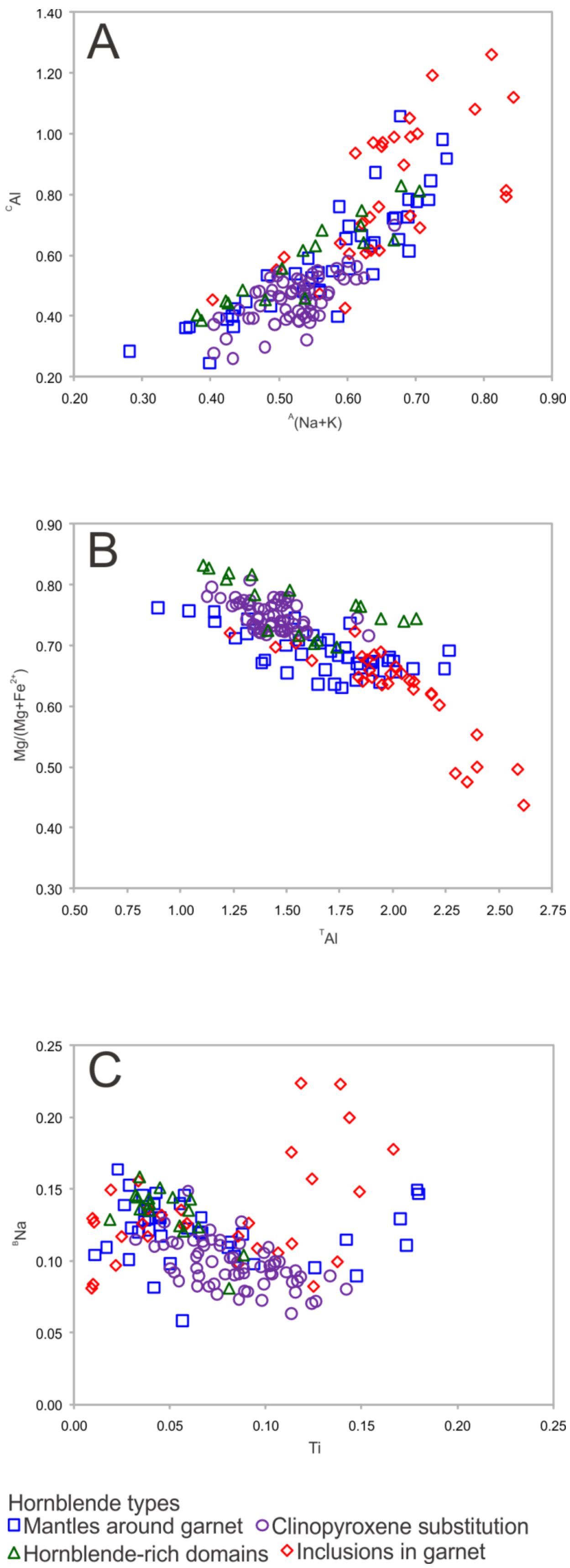

Figure 4.6. Amphibole mineral chemistry data. All axes in apfu, except for the $Mg/(Mg+Fe^{2+})$ axis in (b).

Table 4.3. Representative analyses of amphibole from the study sample. Abbreviations: *Text. cont.* - textural context; *cpx sub* - clinopyroxene substation; *mant grt* - mantles around garnet; *incl grt* - inclusions in garnet; *hbl agg* - hornblende aggregates; *n.d.* - below detection limit.

Mineral	Amphibole							
Text. Cont.	cpx sub	cpx sub	mant grt	mant grt	incl grt	incl grt	hbl agg	hbl agg
Point	Hbl 1.9	Hbl 5.7	Hbl 4.12	Hbl 8.25	Hbl 8.13	Hbl 2.4	Hbl 9.6	Hbl 6.1
SiO_2	46.25	47.85	46.25	38.95	36.51	42.22	41.66	46.39
TiO_2	0.70	0.63	0.34	0.72	0.08	1.09	0.35	0.75
Al_2O_3	10.93	8.85	10.33	18.36	17.24	16.58	15.43	10.67
FeO	11.63	10.57	13.53	13.27	20.13	13.15	15.33	10.27
MnO	0.04	0.04	0.07	0.10	0.09	0.07	0.08	0.04
MgO	14.39	15.77	13.85	11.13	7.15	11.33	11.13	15.37
CaO	11.65	11.64	11.27	11.38	11.15	10.81	11.12	12.03
Na_2O	2.08	1.75	1.97	2.80	2.85	2.76	2.59	1.88
K_2O	0.22	0.15	0.18	0.30	0.29	0.33	0.25	0.21
Cr_2O_3	0.04	0.01	0.04	0.06	0.02	0.01	0.02	0.11
Total:	98.05	97.39	97.92	97.29	97.46	98.69	98.16	97.82
Oxygens	23	23	23	23	23	23	23	23
Si	6.66	6.87	6.69	5.73	5.65	6.11	6.10	6.65
Ti	0.08	0.07	0.04	0.08	0.01	0.12	0.04	0.08
Al	1.85	1.50	1.76	3.19	3.14	2.83	2.66	1.80
Fe^{2+}	1.12	0.95	1.16	1.09	1.82	1.26	1.32	0.91
Mn	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00
Mg	3.09	3.38	2.99	2.44	1.65	2.44	2.43	3.28
Ca	1.80	1.79	1.75	1.79	1.85	1.68	1.74	1.85
Na	0.58	0.49	0.55	0.80	0.85	0.77	0.73	0.52
K	0.04	0.03	0.03	0.06	0.06	0.06	0.05	0.04
Cr	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Fe^{3+}	0.28	0.32	0.47	0.54	0.79	0.33	0.55	0.32
Total	15.50	15.40	15.45	15.74	15.83	15.61	15.63	15.46

Table 4.4. Representative analyses of plagioclase from the study sample. Abbreviations: *Text. cont.* - textural context; *symp* – clinopyroxene-plagioclase symplectites; *mant grt* - mantles around garnet; *hbl agg* - hornblende aggregates; *n.d.* - below detection limit.

Mineral	Plagioclase					
Text. Cont.	symp	symp	mant grt	mant grt	hbl agg	hbl agg
Point	Plg 1.6	Plg 5.5	Plg 8.14	Plg 9.3	Plg 6.2	Plg 10.2
SiO_2	63.04	62.28	59.42	61.64	62.87	63.10
TiO_2	0.00	*n.d.*	*n.d*	*n.d*	*n.d*	0.05
Al_2O_3	23.76	24.03	26.25	24.42	23.50	23.86
FeO	0.11	0.13	0.15	0.18	0.06	0.11
MnO	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	4.53	4.63	7.05	4.82	3.66	4.22
Na_2O	9.16	8.93	7.64	8.79	9.40	9.14
K_2O	0.08	0.07	0.06	0.07	0.06	0.05
BaO	0.01	*n.d.*	0.01	0.09	0.03	0.05
SrO	0.11	0.14	0.17	0.11	0.09	0.17
Total	100.79	100.23	100.75	100.13	99.67	100.75
Oxygens	8	8	8	8	8	8
Si	2.77	2.76	2.64	2.73	2.79	2.77
Ti	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.23	1.25	1.37	1.28	1.23	1.24
Fe^{2+}	0.00	0.00	0.01	0.01	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.21	0.22	0.34	0.23	0.17	0.20
Na	0.78	0.77	0.66	0.76	0.81	0.78
K	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.01	5.01	5.01	5.01	5.01	5.00

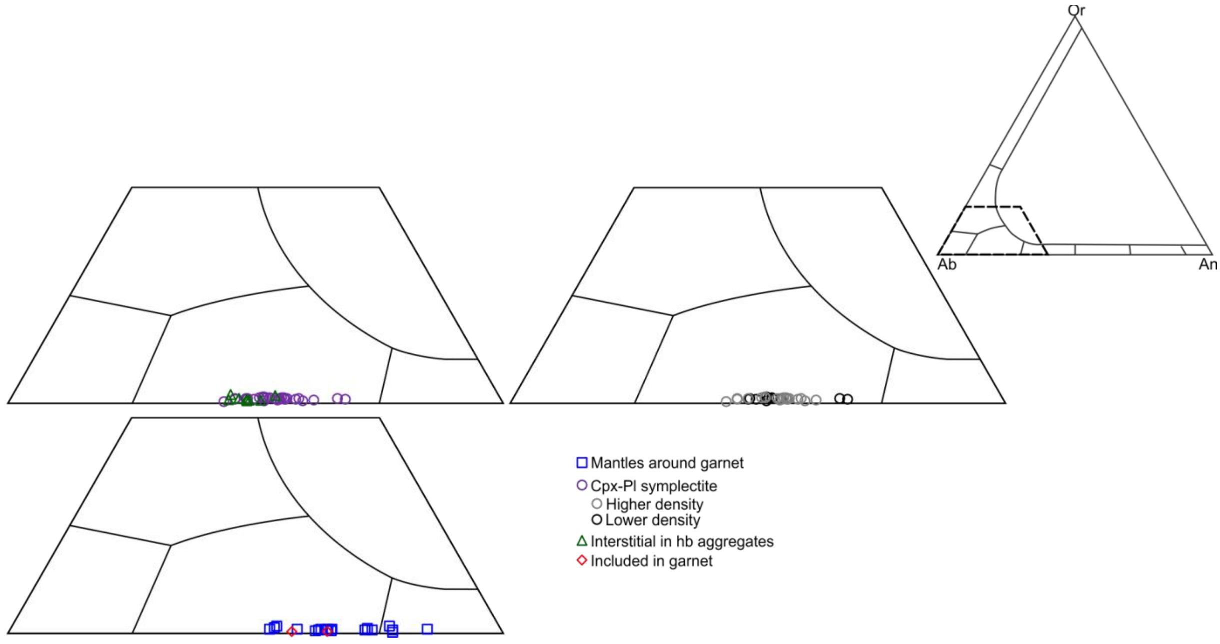

Figure 4.7. Plagioclase mineral chemistry data, shown as plots on a section of the orthoclase-albite-anorthite triangle.

4.6 Thermodynamic Modelling

The study rock presents clear disequilibrium textures, such as coronas and symplectites, which would pose against a thermodynamic modelling approach. However, the textures allow for the original assemblage to be inferred with a reasonable degree of confidence (see petrography, also specific comments below). Furthermore, even at this stage of disequilibrium, certain compositional features may be preserved. In this case, the Na content of clinopyroxene is of special interest, since it is sensitive to pressure (Deer *et al.* 1978, and references therein), so that a comparison between modelled and measured values provides a good estimative of pressure.

Pseudosections (Figures 4.8-4.11) were calculated in the chemical system NCKFMASHTO, using THERMOCALC (Powell & Holland, 1988), version 3.45, and dataset ds6.2 (Holland & Powell, 2011; updated at Febuary 6th, 2012). The activity composition models used for clinopyroxene and amphibole are those of Green *et al.* (2016), while the ones for other phases are from White *et al.* (2014b) and references therein. Rutile, sphene, quartz, lawsonite, and aqueous fluid are considered as pure phases.

In the presence of H_2O, melting can occur for the conditions modeled here, especially at the lowest pressures (Schmidt & Poli, 1998; Palin *et al.*, 2016, and references therein), but the composition and amount of melt would depend critically on the water quantity (Weinberg

& Hasalová, 2015). The rocks present no evidence of melting, and, at the conditions modeled small amounts of water are enough to saturate the system, so we assumed that the best approximation of the modeled situation would be achieved with calculations considering H_2O to be in excess, but ignoring a melt phase. Nonetheless, a pseudosection with melt bearing equilibria (Figure 4.10) was calculated, with an H_2O content of 3.7 mol%, enough to the rock to be saturated at the solidus, at 13 kbar. Apart from the presence of melt, and a reduction of the stability field of muscovite, there is little difference in the calculated phase relations.

Besides H_2O content and melt presence or absence, another factor that can influence the model results is the assumed $Fe^{3+}/(Fe^{3+}+ Fe^{2+})$ ratio, therefore referred to as $X_{Fe^{3+}}$ (White *et al.*, 2000; Diener & Powell, 2010). The FeO content of the sample was measured by wet chemical tritation. The resulting $X_{Fe^{3+}}$ is 0.33. Due to alteration and potential oxidation in the preparation process, the measured Fe_2O_3 content, obtained by subtraction of the FeO content from the total Fe, is a measure of the maximum original Fe_2O_3 content of the rock (Diener & Powell, 2010), so we assumed $X_{Fe^{3+}}$ to be 0.20. A P-$X_{Fe^{3+}}$ pseudosection (Figure 4.11) between $X_{Fe^{3+}} = 0$ and $X_{Fe^{3+}} = 0.35$ was also calculated, and the results will be discussed below.

The P-T pseudosection is calculated for the range 12-25 kbar and 600-800 °C (Figures 4.8, 4.9). Most of the diagram shows the stability of mineral assemblages dominated by hornblende, clinopyroxene and garnet, except at P > 20-21 kbar, where hornblende runs out, bringing the typical eclogite facies assemblage, dominated by garnet and omphacitic clinopyroxene. Sphene is the stable Ti-bearing phase up to ≈ 14 kbar, while rutile is stable at higher P. Most of the covered T spectrum is above the calculated position of the diopside-omphacite *solvus*, with the extreme of the curve visible at left-hand side of the diagram. Epidote is calculated to be stable at $T < \approx 700$ °C and muscovite at $P > \approx 17$ kbar. Quartz is present throughout, and lawsonite occurs at the low-T, high-P corner of the diagram.

As seen in the *petrography* section, the inferred peak assemblage is garnet + omphacitic clinopyroxene, + rutile ± quartz ± hornblende. In the pseudosection, this assemblage is calculated to be stable at a large field, at T higher than 700 °C, due to the absence of epidote, and P between 14 and 17 kbar, bracketed by sphene-*in* and muscovite-*in* lines. However, the study sample is very K_2O-poor (see Table 4.1), and, in consequence, muscovite calculated mode is so small that, if present, it is possible that it would not appear in the thin sections, and, moreover, the calculated mode is close to the uncertainty. Given this, a more reasonable upper-*P* limit would be the hornblende stability limit, at 20 kbar for the relevant temperatures.

THERMOCALC standard output for Na content in clinopyroxene is as the Na fraction in the M2 crystallographic site. Structural formulae were calculated for six oxygen atoms, what results in one M2 site per formula, thus making the values are directly comparable to what was reported in the mineral chemistry section. Na contents in clinopyroxene are generally between 0.12 and 0.15 apfu, which is below the range of the calculated isopleths. The Na value for the reconstructed clinopyroxene composition is 0.18 apfu, which would result in a pressure of ≈ 13.6 kbar. However, several analyses display higher Na contents, the highest being 0.24 apfu. This value indicates a pressure of ≈16 kbar. In their discussion about similar rocks to those being discussed here, Tedeschi *et al.* (2017) argued that, since Na is very mobile, and given the coupled nature of the substitution of Na and Al in the clinopyroxene structure, the Al content of reconstructed clinopyroxene composition would be a reasonable proxy for the previous Na content. The Al content of the reconstructed composition is 0.3 apfu, so, applying the same reasoning here, the Na content would be 0.3 Na apfu, pointing to a minimum pressure between 17.5 and 17.9 kbar (Figure 4.8).

Isopleths of garnet composition were calculated as well. THERMOCALC output for Ca is the ratio of this element in the X site, which is approximately equal to grossular proportion, as long as andradite and uvarovite components are low (which is the case). In the pseudosection, Ca proportion varies from 0.42 to 0.3. It decreases as pressure increases, until hornblende is removed from the assemblage. At higher pressures it starts increasing, but at a very low rate, (Figure 4.9). Fe^{2+} and Mg values are given by THERMOCALC in the form of $Fe^{2+}/(Fe^{2+} + Mg)$ ratios. Isopleths of this ratio behave as diagonal lines in the diagram (Figure 4.9) going from 0.84 at the low-*P*, low-*T* corner, to little below 0.56, at the opposite corner. $Fe^{2+}/(Fe^{2+} + Mg)$ in the analyzed garnets range from 0.67 to 0.73.

The analyzed compositions do not fit the modelled ones, as only the highest measured Ca values overlap with the lowest modelled values, and these would be produced at higher *P* and *T* relative to conditions indicated by analyzed $Fe^{2+}/(Fe^{2+} + Mg)$ ratio. Moreover, analyzed Ca contents could represent temperatures lower than what was modelled. This kind of result is not unexpected, as garnet compositions in this case are a combination of prograde and retrograde effects.

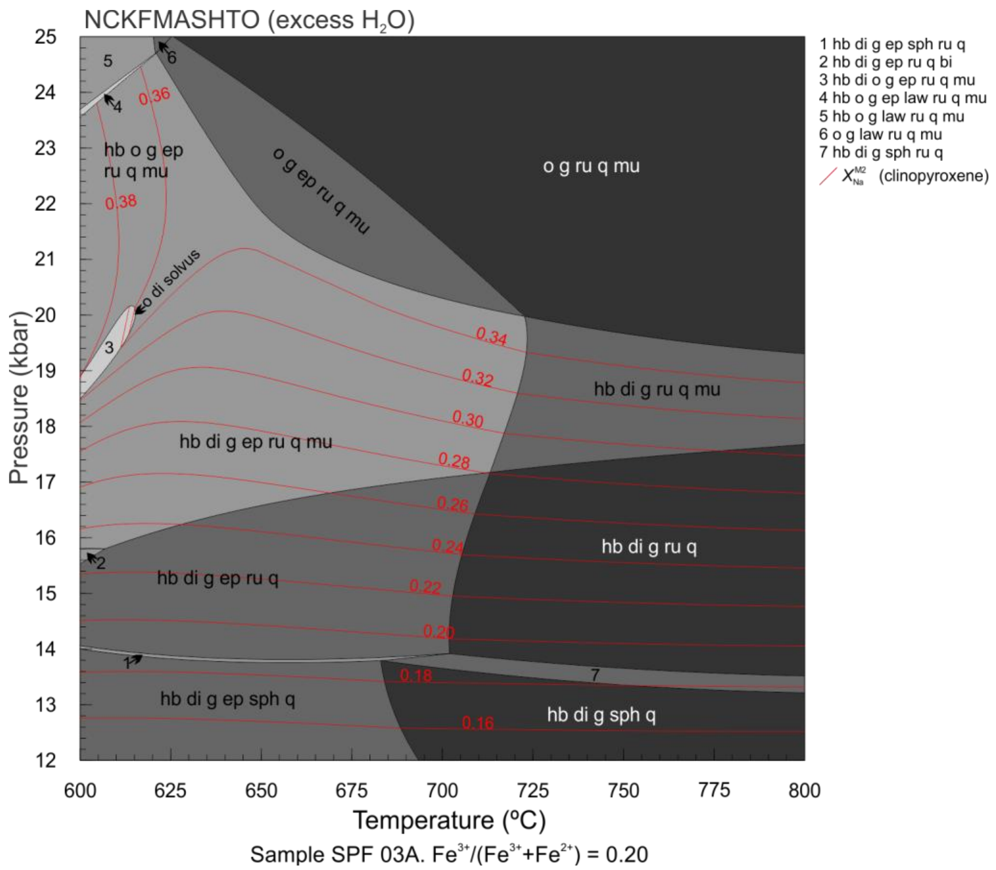

Figure 4.8. *P-T* pseudosection calculated for sample SPF 03A. Red lines are isopleths of fraction of Na in the clinopyroxene M2 site.

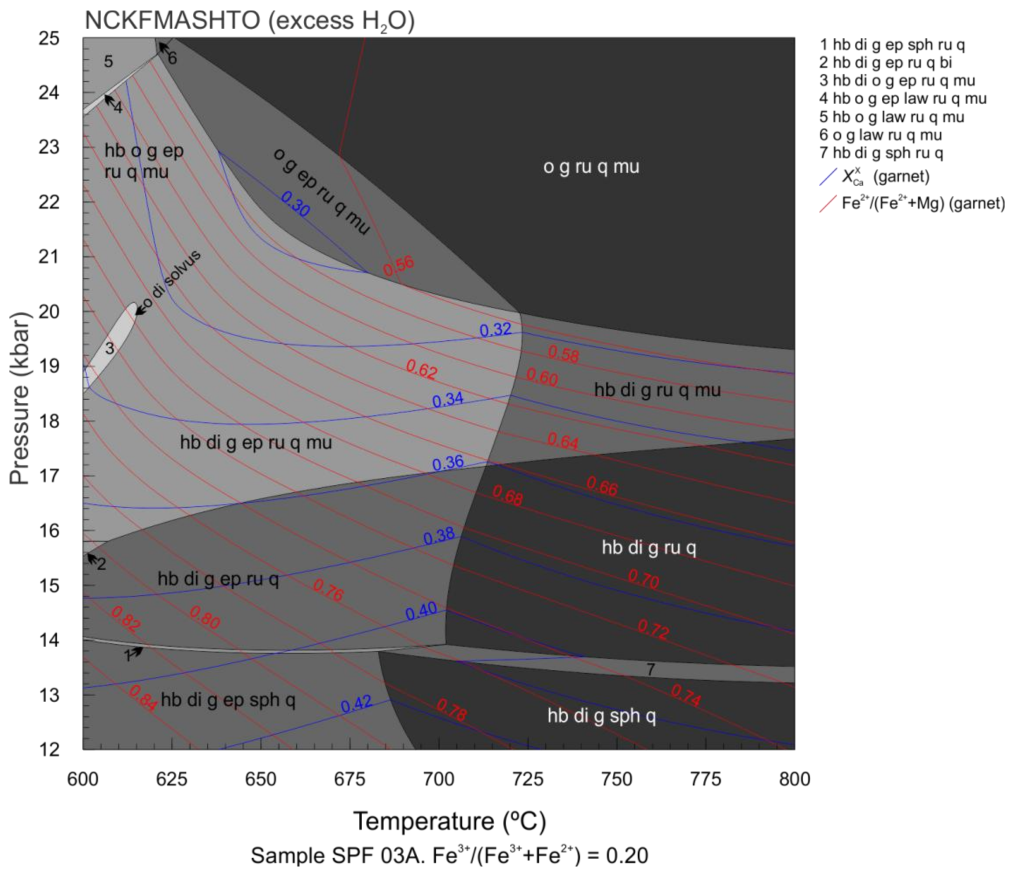

Figure 4.9. The same pseudosection of figure 4.8, contoured for garnet compositional variables: fraction of Ca in the X site (blue lines) and $Fe^{2+}/(Mg+Fe^{2+})$ ratio (red lines).

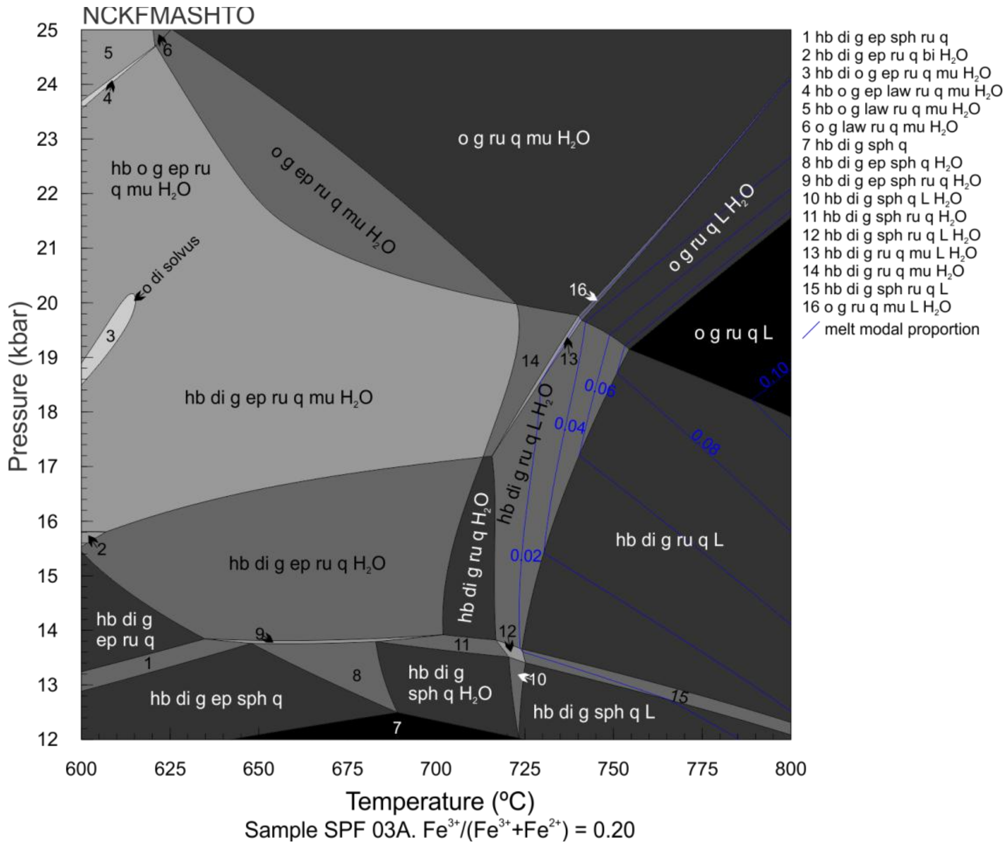

Figure 4.10. P-T pseudosection calculated for sample SPF 03A, taking melt-bearing equilibria into consideration.

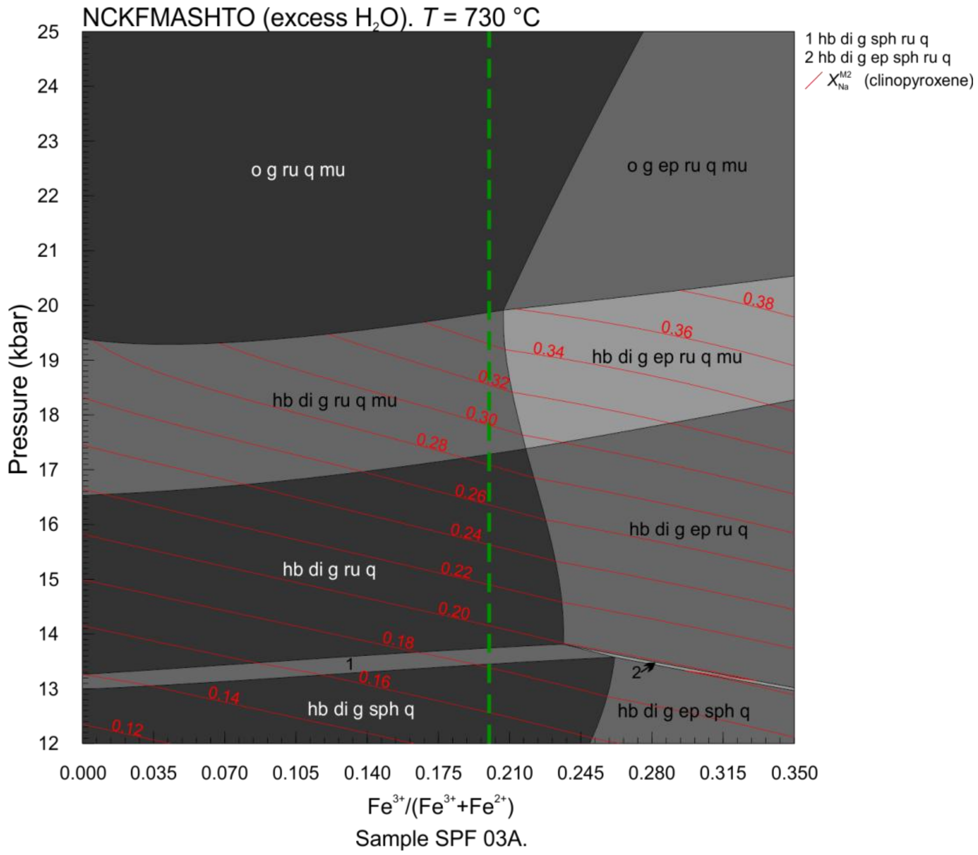

Figure 4.11. P-$X_{Fe^{3+}}$ pseudosection for sample SPF 03A, calculated for T = 730 °C. The dashed green line marks the $X_{Fe^{3+}}$ value used in the calculation of the P-T pseudosections shown in figures 4.8-4.10.

4.7 Trace-element Thermobarometry

4.7.1 Ti-in-quartz

In order to apply the Ti-in-quartz thermobarometer (Wark & Watson, 2006; Thomas *et al.*, 2010), Ti contents in quartz were analyzed by LA-ICP-MS at the Microgeochemistry Laboratory at the Department of Earth Sciences at the University of Gothenburg, Sweden, with a New Wave NWR213 laser ablation system coupled to an Agilent 8800 triple quadrupole ICP-MS and at the ICP Laboratory of the NAP Geonalítica, Geosciences Institute-University of São Paulo, using a Thermo Fisher Scientific iCAP Q ICP-MS. Rutile is abundant in the rock, so TiO_2 activity is considered to be 1. The *P-T* results were obtained using the calibration presented by Thomas *et al.* (2010). The following isotopes were analyzed: ^{7}Li, ^{27}Al, ^{29}Si, ^{48}Ti, ^{49}Ti, ^{57}Fe and ^{72}Ge. Ti concentrations were calculated using ^{49}Ti to avoid the isobaric interference from ^{48}Ca (present in most well characterized reference glasses) on ^{48}Ti. Results are presented in Table 4.5 and Figure 4.13, in form of Ti isopleths.

Quartz occurs mainly as millimetric aggregates of relatively large crystals, and can also occur as smaller crystals associated to the symplectites and coronas and as inclusions in garnet (Figures 4.12a, 4.12b). Crystals included in garnet display lower Ti contents (6-14 ppm) while matrix crystals display higher (19-50ppm) Ti contents (Figure 4.13). Textural characteristics of the matrix crystals, be it size or position relative to other minerals, do not influence Ti content. All quartz, regardless of textural context, lack features indicative of intense recrystallisation. Most crystals display slight undulose extinction (figure 4.12c).

The difference between Ti contents of crystals included in garnet and matrix crystals suggests that the crystals included in garnet register an early point in the metamorphic *P-T* path of the rock.

The relatively large variation of the Ti contents of the matrix crystals allow for different interpretations, and more so given that the texture of the studied rock partially reflects retrograde processes. This will be discussed further on.

4.7.2 Zr-in-rutile

For application of the Zr-in-rutile thermobarometer (Zack *et al.*, 2004; Tomkins *et al.*, 2007), rutile crystals were analyzed by LA-ICP-MS at the University of Gothenburg, Sweden, using a New Wave NWR213 laser ablation system coupled to an Agilent 8800 triple quadrupole ICP-MS. Zircon is much less abundant than rutile, but rare small crystals are present, so ZrO_2 activity is buffered and also considered to equal 1. The results are presented in Table 4.6, and in the form of Zr isopleths in Figure 4.13, together with Ti-in-quartz results.

Rutile is present as inclusions in garnet and in the matrix. In garnet, its presence is independent from zone, *i.e.* it occurs at core and rims of the host crystals (Figure 4.12a). Similarly, matrix crystals occur inside the clinopyroxene-plagioclase symplectites, associated to the hornblende aggregates, and even associated to the coronas around garnet (Figures 4.12d, 4.12e). Many of the crystals are mantled by sphene coronas, but a roughly equal amount is not. Sphene coronas are present in rutile from all textural contexts. The one textural context that seems to favor the presence of sphene is represented by rutile crystals associated to hornblende "patches" in clinopyroxene-plagioclase symplectites (Figure 4.12f).

The variety of textures does not allow inferences about timing of rutile crystallization. Thermodynamic modelling predicts rutile mode to vary little after it substituted all sphene.

Five crystals included in garnet and fourteen matrix crystals were analyzed. Crystals with sphene coronas were avoided. Crystals included in garnet display lower Zr contents (216-362 ppm) than matrix crystals (320-537 ppm). Both sets of data display a rather large variation, which, however, is not higher than variation found, for example, by Tedeschi *et al.* (2017) in retroeclogites from Pouso Alegre (SE from the rocks studied here) and by Tual *et al.* (2018) in eclogites from the Sveconorwegian Orogen (SW Sweden).

In the case of the crystals included in garnet, it can be interpreted that their predominantly lower Zr contents reflect early stages in the metamorphic trajectory, which were preserved due to the isolation of these crystals inside garnet. The variation in Zr contents of the matrix crystals, on the other hand, may either reflect earlier, preserved stages (suppose a crystal originally included in clinopyroxene, for example), or re-equilibration under lower-temperature conditions.

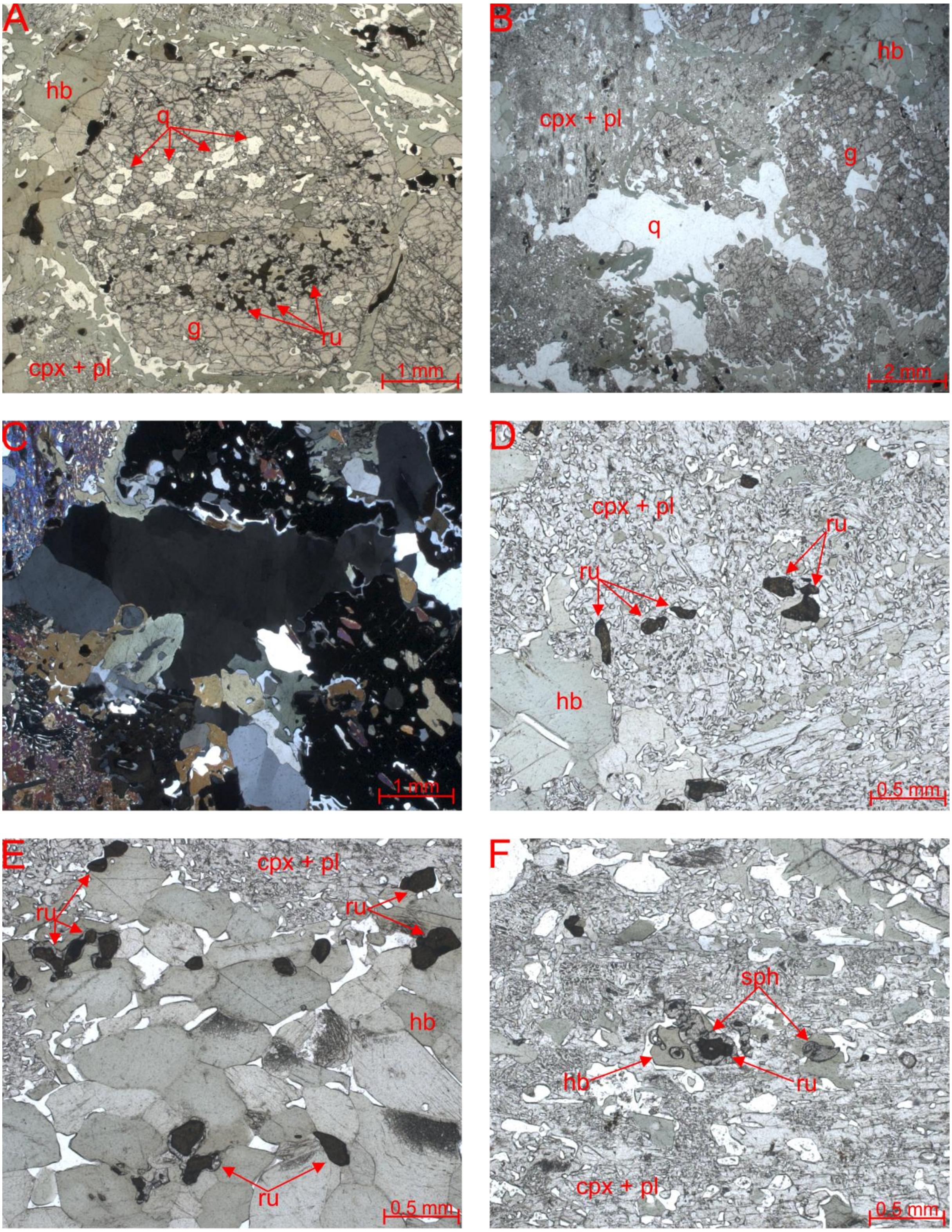

Figure 4.12. (a) Quartz and rutile crystals included in garnet. (b) A quartz aggregate. (c) The same aggregate shown in (b), at higher magnification and under crossed polars. Note the absence of features indicative of intense recrystalization. (d) Rutile crystals amidst a clinopyroxene-plagioclase symplectite. (e) Rutile crystals in a hornblende aggregate. (f) Rutile crystals associated to a hornblende “patch” in clinopyroxene, and mantled by sphene. At center-right, a sphene crystal that appear to have completely substituted a rutile crystal.

Table 4.5. Ti-in-quartz data.

LA Spot	Texture	Ti (ppm)	*T* at 6kbar (°C)	*T* at 25 kbar (°C)
43	incl garnet	10	476	823
44	incl garnet	6	447	780
45	incl garnet	14	500	858
45	incl garnet	6	444	776
48	incl garnet	9	468	811
49	incl garnet	8	464	805
A3	matrix	27	547	927
A5	matrix	26	545	924
A5a	matrix	19	519	886
A6	matrix	21	529	901
A7	matrix	28	550	932
A8	matrix	76	636	1058
A9	matrix	99	663	1097
A11	matrix	39	577	970
A13	matrix	38	575	968
A14	matrix	50	598	1002
A15	matrix	41	580	976
A15a	matrix	37	572	963
A16	matrix	39	577	972
A20	matrix	30	556	940
A21	matrix	42	583	980
A22	matrix	35	567	956
A23	matrix	46	590	990
A24	matrix	106	669	1106
A26	matrix	30	556	940
A27	matrix	39	576	970
A28	matrix	35	568	958
A29	matrix	29	552	934
A30	matrix	50	598	1002
A31	matrix	29	553	935
A33	matrix	23	535	909
A34	matrix	33	562	949
A35	matrix	39	575	969
A12	matrix	40	579	973
A17	matrix	24	536	911
A18	matrix	29	552	934
A19	matrix	113	676	1116
A32	matrix	82	644	1068

Table 4.6. Zr-in-rutile data.

LA Spot	Text cont	Zr (ppm)	*T* at 6kbar (°C)	*T* at 25 kbar (°C)
64	matrix	357	646	729
65	matrix	402	656	740
66	matrix	524	679	765
67	matrix	387	653	736
68	incl garnet	293	630	712
69	incl garnet	292	630	712
70	incl garnet	362	647	731
71	matrix	417	659	743
72	matrix	436	663	747
73	matrix	418	659	744
74	matrix	401	656	740
75	matrix	412	658	742
76	incl garnet	216	607	687
77	incl garnet	233	613	693
78	matrix	409	658	742
79	matrix	537	681	767
80	matrix	381	652	735
81	matrix	320	638	720
82	matrix	489	673	758

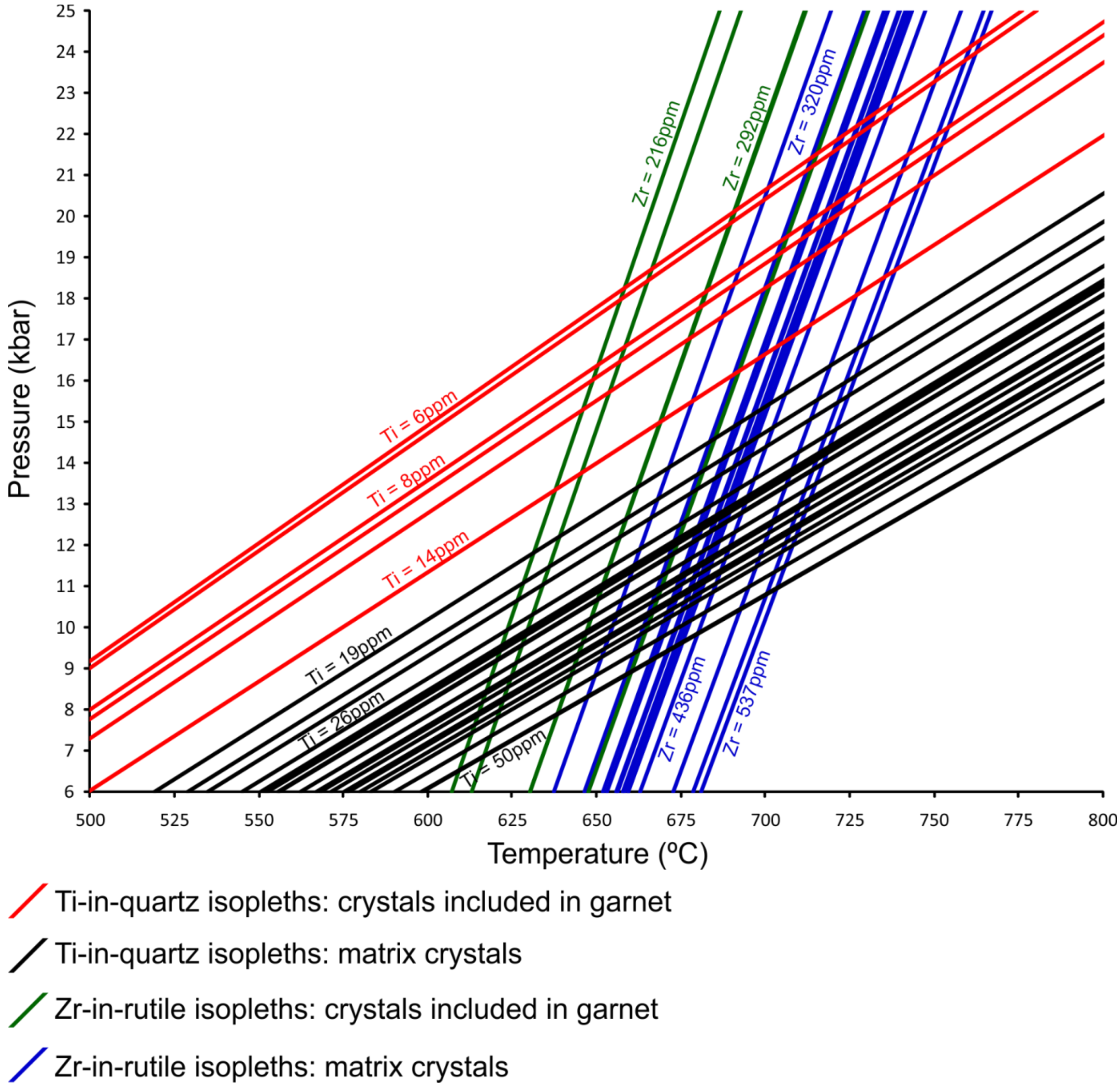

Figure 4.13. Isopleths of Ti contents in quartz and Zr contents in rutile.

4.8 Discussion

4.8.1 Pressure-temperature estimate

The combination of different methods to constrain the *P-T* paths of metamorphic rocks has been shown to be a sound approach (*e.g.* Tedeschi *et al.*, 2017; Tual *et al.*, 2018). In the present case, different methods potentially provide evidence on different stages.

The effect of pressure on Zr-in-rutile content is not negligible, but is small enough that decompression is unlikely to produce *higher* Zr contents, as it would have to be unrealistically close to isothermal. So, the highest Zr contents in rutile provide a good estimate of the highest *temperature* reached by the rock. This result can be used to constrain the thermodynamic modelling: There is no indication of the presence of epidote in the rock, and the calculated *P*-*T* pseudosection shows it to be absent at the temperatures given by Zr-in-rutile data. The *P*-$X_{Fe^{3+}}$ pseudosection (Figure 4.11) shows that, at 730 °C (*T* indicated by Zr-in-rutile at 17 kbar) choosing a higher $X_{Fe^{3+}}$ value would make epidote stable along all the covered *P* range. It is, therefore, an indication that $X_{Fe^{3+}}$ value used is reasonable.

As discussed above, Na content in clinopyroxene provides an estimative of minimum pressure, at least. In this case, measured Na content indicates ≈ 16 kbar, while the Na content that would be inferred from reconstructed Al content indicates 17.5-17.9 kbar. Unfortunately, it is not clear if the clinopyroxene with highest Na contents was equilibrated at maximum temperature. Ti-in-quartz results can provide additional constraints in the peak conditions, but, contrary to Zr-in-rutile, decompression can lead to Ti contents higher than those at maximum *T*. Crossing Ti-in-quartz isopleths (from matrix crystals) with maximum Zr-in rutile isopleth gives a range of pressures, between 11 and 17 kbar.

Rutile and quartz trace-element data were also obtained for crystals included in garnet. In both cases, the values obtained were lower than what is measured in matrix crystals. If these results are combined (Figure 4.14) they point to an earlier stage at lower temperature (630-690 °C) and higher pressures (13-21 kbar), which overlap with the pressures indicated by isopleths of Na in clinopyroxene.

The data discussed above is not tight enough to allow an accurate *P*-*T* path to be drawn, but it is suggestive of a clockwise path inside the obtained *P* and *T* constraints

4.8.2 Tectonic implications

Despite a relative lack of published articles that specifically treat the Passos *Nappe*, its metamorphism has been described as "subduction-related" (Ganade de Araújo *et al.*, 2014; Valeriano, 2017) at least in part because of the presence of the retroeclogites. However, even with the uncertainties that remain, the conditions determined here do not support a subduction hypothesis and, in fact, are compatible with a collisional setting (*e.g.* Jamieson, 2004).

Given the uncertainties in the *P*-*T* estimates available for the surrounding metapelitc rocks (migmatitic gneiss with kyanite and alkali feldspar; Luvizotto, 2003), it is not unreasonable to suppose that both, metapelitic and metamafic rocks experienced the same collisional *P*-*T* path. This would place the metamorphism of the Araxá *Nappe* units at a different moment of the orogenic story, and would be against their interpretation as originally part of the São Francisco Plate.

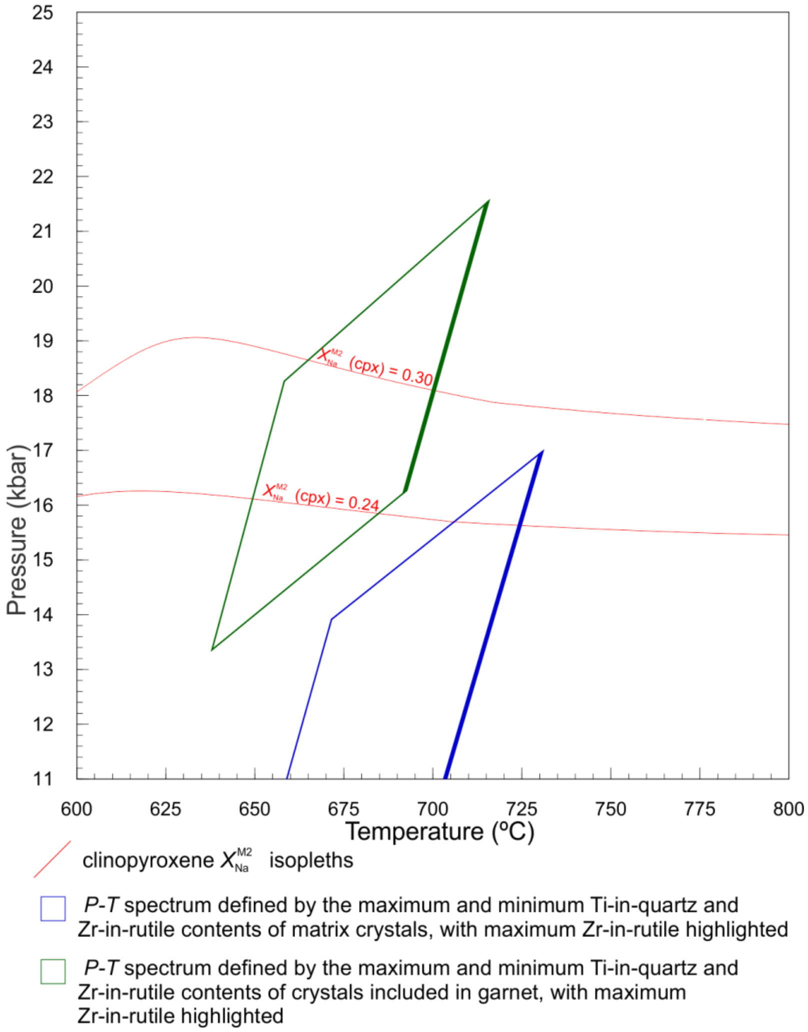

Figure 4.14. The results of the different thermobarometric methods combined. The thin red lines are selected isopleths of Na content in clinopyroxene, specifically the 0.24 and 0.3 lines, which represent the maximum measured Na content and the content that would be inferred by taking the Na content to be equal to the reconstructed Al content (see text). The blue box represents the *P-T* region where the Ti-in-quartz and Zr-in-rutile isopleths obtained from matrix crystals overlap, while the thick blue line highlights the maximum Zr-in-rutile content in a matrix crystal. The green box represents the *P-T* region where the Ti-in-quartz and Zr-in-rutile isopleths obtained from crystals included in garnet overlap, while the thick green line highlights the maximum Zr-in-rutile content in a crystal included in garnet.

4.9 Conclusions

The retroeclogite rocks from São Sebastião do Paraíso are intensily retrogressed mafic rocks that occur amidst the high-grade metapelites from the Araxá Group. Despite the prevalence of retrograde features, it is possible, through a multi-method approach, to put constraints on the metamorphic evolution experienced by the rock. More specifically, it reached a maximum T of 700-730 °C and a maximum P between 16 and 19 kbar. Although these constraints still allow different *P-T* paths to be drawn, they go against a subduction setting, as originally interpreted, and favor a collisional setting, which is also compatible with the surrounding rocks.

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5. TEXTURAL AND MINERALOGICAL EVOLUTION RETROECLOGITES FROM SÃO SEBASTIÃO DO PARAÍSO, MINAS GERAIS, BRAZIL

Manuscript to be submitted to Lithos, with Caio A. Santos, Renato Moraes, George L. Luvizotto and Regiane Fumes as authors.

Abstract: Reaction textures develop when rocks cannot attain chemical equilibrium in the scale of a thin section or hand-specimen, and their study may bring information related to metamorphic processes and the *P-T* paths followed by rocks. In this work a suite of partially retrogressed eclogitic rocks from São Sebastião do Paraíso (Southeastern Brazil) was studied, using petrography, mineral chemistry and thermodynamic modelling. The work was focused in four samples that represent different stages of reequilibration. Samples SPF 03A and 03B are composed by garnet, clinopyroxene-plagioclase symplectites and hornblende aggregates. They present plagioclase-hornblende coronas around garnet, and SPF 03B also present complex reaction textures like garnet mantles around hornblende and multiple, discontinuous coronas of plagioclase, garnet and hornblende around quartz crystals. Sample SPF 01C have epidote, in addition to the minerals present in the previous samples, and less well-defined coronas. Sample SPF 01A present well-defined plagioclase crystals, and its reaction textures are even more diffuse. From the less to the more reequilibrated samples clinopyroxene becomes less sodic, and hornblende and plagioclase compositions converge towards the predicted equilibrium compositions, but, even for the most hydrated/reequilibrated sample, mineral compositions and assemblages do not agree with thermodynamic modelling predictions. Textures and zoning patterns indicate that low mobility of Al and high mobility of Na are the main factors in reaction texture formation. Complex textures in sample SPF 03B are likely relicts of prograde textures.

Keywords: retroeclogite, reaction textures, metamafic rocks

5.1 Introduction and Objectives

Much of the study of metamorphic rocks is based on the assumption that they attained chemical equilibrium at some macroscopic scale, like the scale of a hand-specimen or a thin section. However, this is not always the case, as such a scenario depends on the access of fluid or melt, which act as catalysts to the sluggish metamorphic reactions (Rubie, 1986; Guiraud *et al.*, 2001). In the absence of these catalysts, equilibration volumes may be too small, leading to the development of separate domains, reaction textures, and even no reaction at all, thus preserving the original mineral assemblage (Stüwe, 1997; Nicollet & Goncalves, 2005, White & Clarke, 1997).

It is especially true for eclogites, which, because their combination of the igneous protoliths, sluggish kinetics of metamorphic reactions due to lack of fluids and rapid subduction may result in fast overstepping of several reactions (Rubie, 1990). Eclogites with such characteristics can bring evidence on the mechanisms of their formation, and even on the *P-T* paths they followed (Štípská *et al.*, 2010; Schorn & Diener, 2017).

In this work, samples of retroeclogites from São Sebastião do Paraíso (Southern Minas Gerais State, Brazil) are analyzed with the aim of understanding the mechanisms involved in eclogite formation, retrogression and preservation and destruction of high-pressure mineral assemblages.

5.2 Geological Setting

The neoproterozoic Southern Brasilia Orogen was formed by the collision between the Amazon, São Francisco and Paranapanema Plates (Valeriano *et al.*, 2004a, b; Campos Neto *et al.*, 2004; Pimentel *et al.*, 2011). Among the tectonic domains that compose the Southern Brasilia Orogen is the Passos Nappe (Figure 5.1), a large allocthon composed mainly by metasedimentary rocks of the Araxá Group (Teixeira & Danni, 1978; Simões, 1995). The sources of the Araxá Group at the Passos Nappe are of paleoproterozoic to mesoproterozoic ages (Valeriano *et al.*, 2004b).

The Passos Nappe displays an inverse metamorphic gradient, with biotite-chlorite-muscovite schist occurring at the base, garnet-biotite-muscovite schist at intermediate portions and migmatitic kyanite-garnet gneisses at the top the structural pile (Teixeira & Danni, 1978; Simões *et al.*, 1988; Simões, 1995). The variation in the metamorphic conditions is calculated to be between 550 °C at 7 kbar and 800 °C at 14 kbar (Luvizotto, 2003).

The retroeclogites correspond to petrographic variations of clinopyroxene-garnet-hornblende schist and fels, which characteristically present clinopyroxene-plagioclase symplectite. In the São Sebastião do Paraíso region they were first described by Hoppe (1985), who was also the first to propose the interpretation implied by the name, *i.e.*, that these rocks are strongly retrogressed eclogites. Afterwards, similar rocks were described in other parts of the Southern Brasília Orogen (*e.g.* Choudhuri *et al.*, 1978; Coelho *et al.*, 2017, Tedeschi *et al.*, 2017). In a companion paper, Santos *et al.* (in preparation-chapter 4, this volume) estimated, for the retroecolgites studied here, the maximum P to be between 16 and 19 kbar, and maximum T to be ≈ 730 °C.

The samples studied here, in particular, come from two outcrops 9.5 km apart one from another and both are hosted by high-pressure migmatites (Luvizotto, 2003).

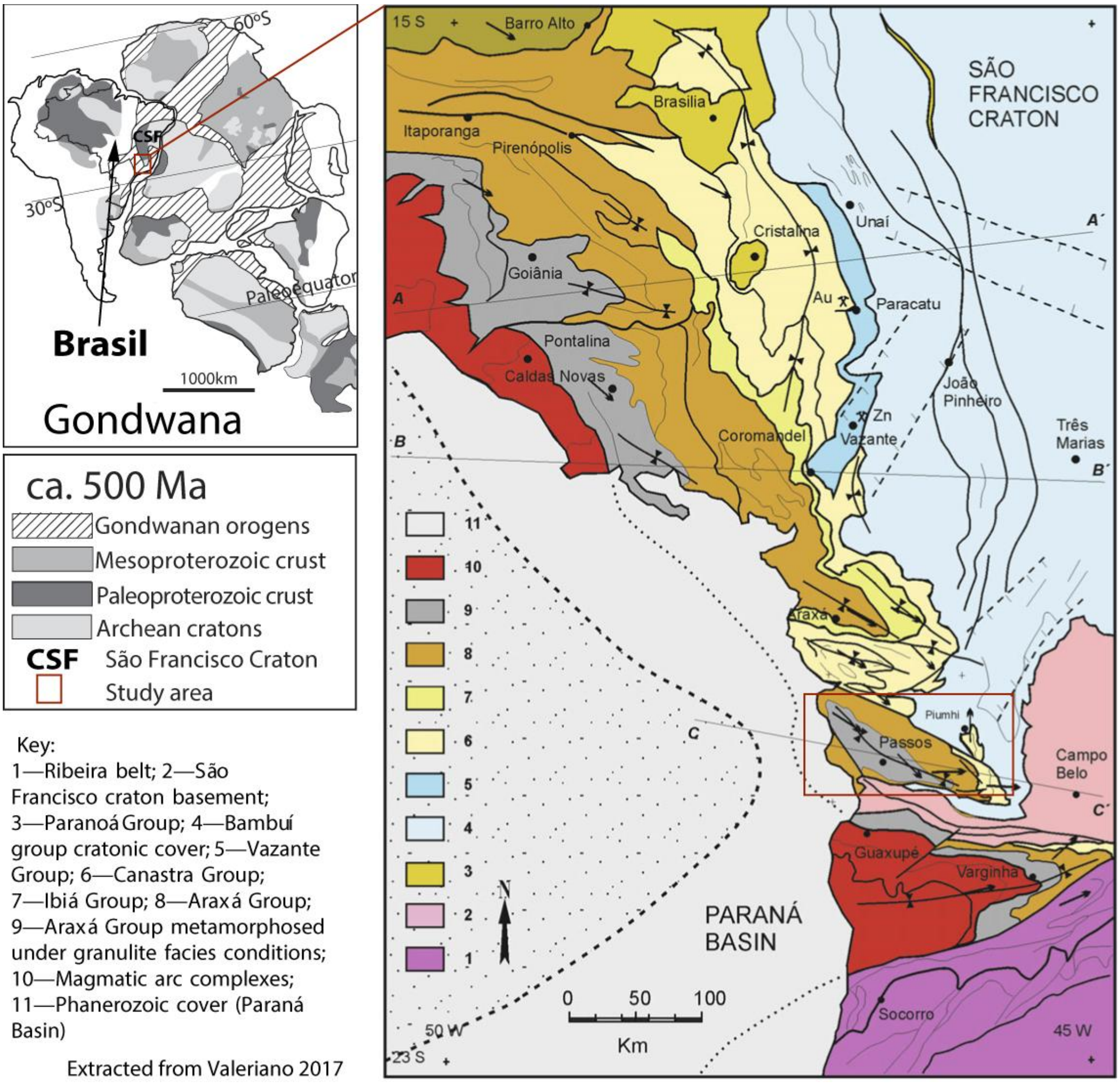

Figure 5.1. Tectonic map of Southern Brasilia belt and adjoining southwestern margin of the São Francisco craton (Extracted from Valeriano, 2017), showing the locations and geological context of the study area.

5.3 Geochemistry

Two samples were analyzed in the X-ray Fluorescence Laboratory of the NAP Geoanalítica - Institute of Geosciences, University of São Paulo, Brazil, using a PANalytical AXIOS MAX spectrometer. Analyses were performed on fused glass discs, according to the procedures described by Mori *et al.* (1999).

The compositions (table 5.1) are very similar, and all plot on the basalt field of the TAS diagram of Le Maitre *et al.* (1989) (Figure 5.2).

Table 5.1. Chemical composition of the study samples. Values in wt%.

Sample	SPF 01A	SPF 03A	SPF 03B
SiO_2	49.64	49.56	50.50
TiO_2	1.22	1.33	1.32
Al_2O_3	14.11	13.05	13.09
FeO	11.02	13.00	10.90
MnO	0.21	0.20	0.14
MgO	7.10	7.87	7.87
CaO	12.09	11.94	11.15
Na_2O	2.08	1.78	3.18
K_2O	0.28	0.06	0.08
P_2O_5	0.09	0.11	0.11
Total	98.18	98.90	98.49

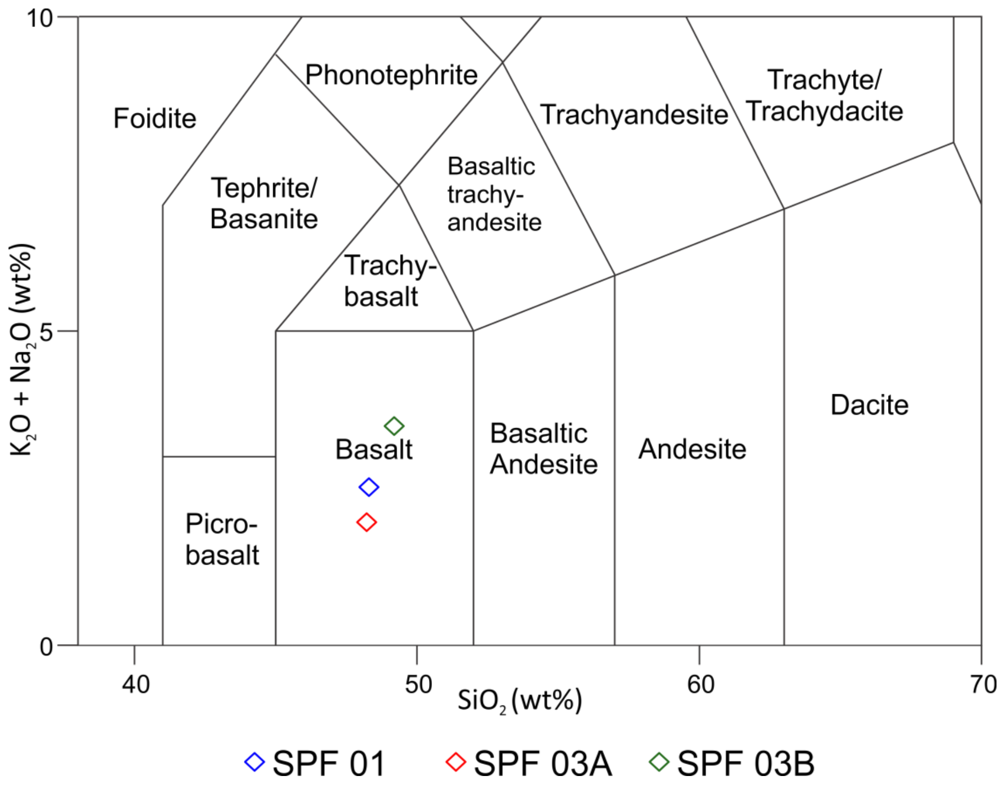

Figure 5.2. The whole-rock compositions of the studied samples plotted in the classification diagram of Le Maitre *et al*. (1989).

5.4 Petrography

The study was concentrated in four samples with different characteristics, which will be described separately below.

5.4.1 SPF 03A

This rock is a hornblende-garnet-clinopyroxene fels with decussate to weekly oriented texture (Figures 5.3a, b, c). It is composed of millimetric garnet porphyroblasts, quartz aggregates and millimetric to centimetric hornblende aggregates over a matrix formed by clinopyroxene-plagioclase symplectite, which can be divided in two textural generations: one is composed of anhedral, millimetric to submillimetric clinopyroxene crystals intergrown with worm-like, micrometric plagioclase crystals, while in the other the area density of intergrowths is smaller and the plagioclase intergrowths are more rectlinear in shape (Figure 5.3d).

Garnet usually is separated from the symplectites by a double corona composed of an inner layer of plagioclase and an outer layer of hornblende (Figures 5.4a, b). The inner layer is usually thinner (up to 0.1 mm), while the outer one can be up to 0.3-0.5 mm thick. Despite usually following the basic model described above, several coronas present irregularities, like one of the layers lacking around part of the garnet crystal or layers merging into crystals from outside the texture (Figures 5.4a-d). Garnet crystals are rich in inclusions, mainly quartz, but also rutile, hornblende, plagioclase and opaque minerals. Several quartz, rutile and hornblende inclusions are mantled by thin (< 0.1 mm) plagioclase films (Figures 5.4e, f)

Both the hornblende and the quartz aggregates are irregular in shape. Hornblende crystals are millimetric and subidioblastic, and its aggregates include interstitial plagioclase (Figures 5.3a, b). Hornblende can also occur as patches in clinopyroxene, in textures that suggests it replaced clinopyroxene (Figure 5.3c). Rutile crystals (both in matrix and as inclusion in garnet) can be mantled by sphene (Figure 5.3d).

5.4.2 SPF 03B

This hornblende-garnet-clinopyroxene fels has garnet porphyroblasts and hornblende aggregates over a matrix composed of clinopyroxene-plagioclase symplectite, but there are several important differences between this sample and the previous one. In this rock plagioclase intergrowths in clinopyroxene are wider, and the symplectites present no different textural generations. Garnet porphyroblasts are smaller than they are in SPF 03A, and hornblende crystals commonly occur isolated, or as anhedral crystals that seem to substitute for clinopyroxene in the symplectites (Figures 5.5a, b). Hornblende aggregates include more interstitial plagioclase and can also include clinopyroxene-plagioclase symplectites (Figure 5.5c).

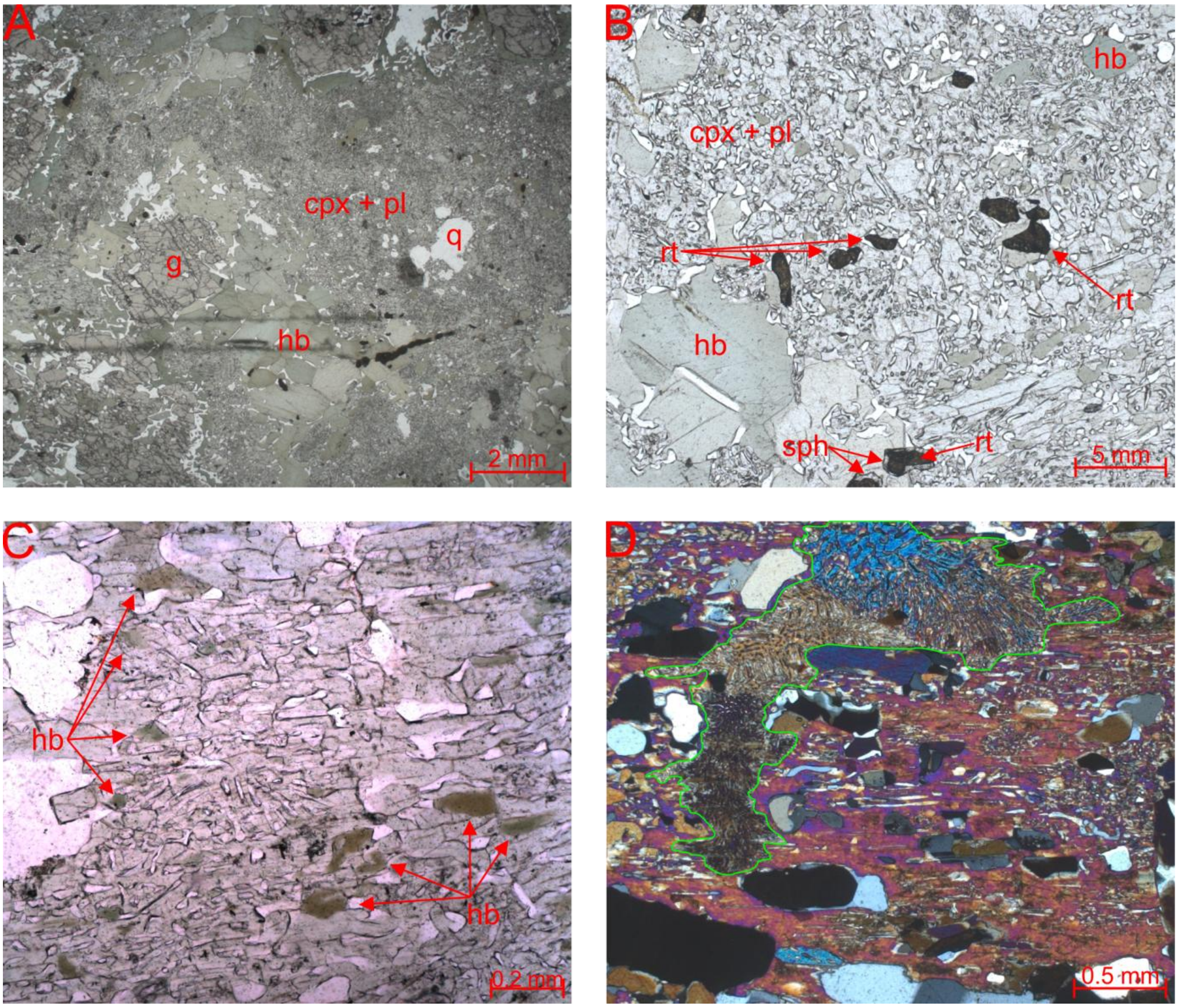

Figure 5.3. General aspect of sample SPF 03A. *a-c*: plane polarized light. *d:* cross-polarized light. The green line marks the boundary between clinopyroxene with a high density of plagioclase intergrowths (inside) and clinopyroxene with low density of plagioclase intergrowths (outside).

SPF 03B presents a greater diversity of reaction textures, and more complex ones. The complex textures may be considered as more complex "versions" of the simpler ones, or as combinations of two or more texture types.

Among the simple textures present are plagioclase-hornblende double coronas around garnet, which are essentially the same texture described in sample SPF 03A (Figures 5.6a, b). Another type corresponds to clinopyroxene films around quartz crystals, which are discontinuous and can merge into clinopyroxene-plagioclase symplectites (Figures 5.6c, d).

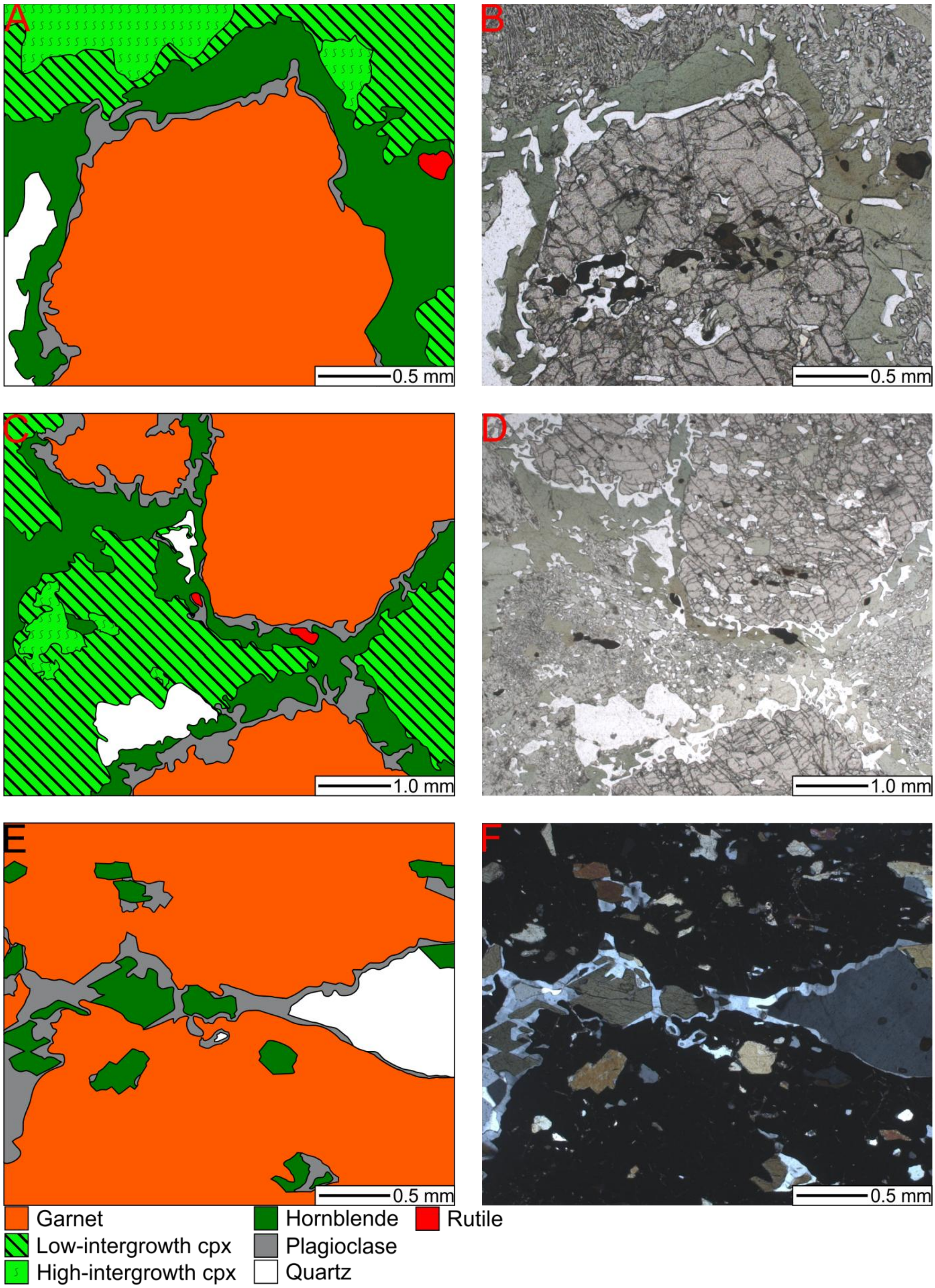

Figure 5.4. Reaction textures in sample SPF 03A, as simplified sketches (*a*, *c* and *e*, left-hand side) and as photomicrographs (right-hand side; *b* and *d*: plane-polarized light, *f*: cross-polarized light).

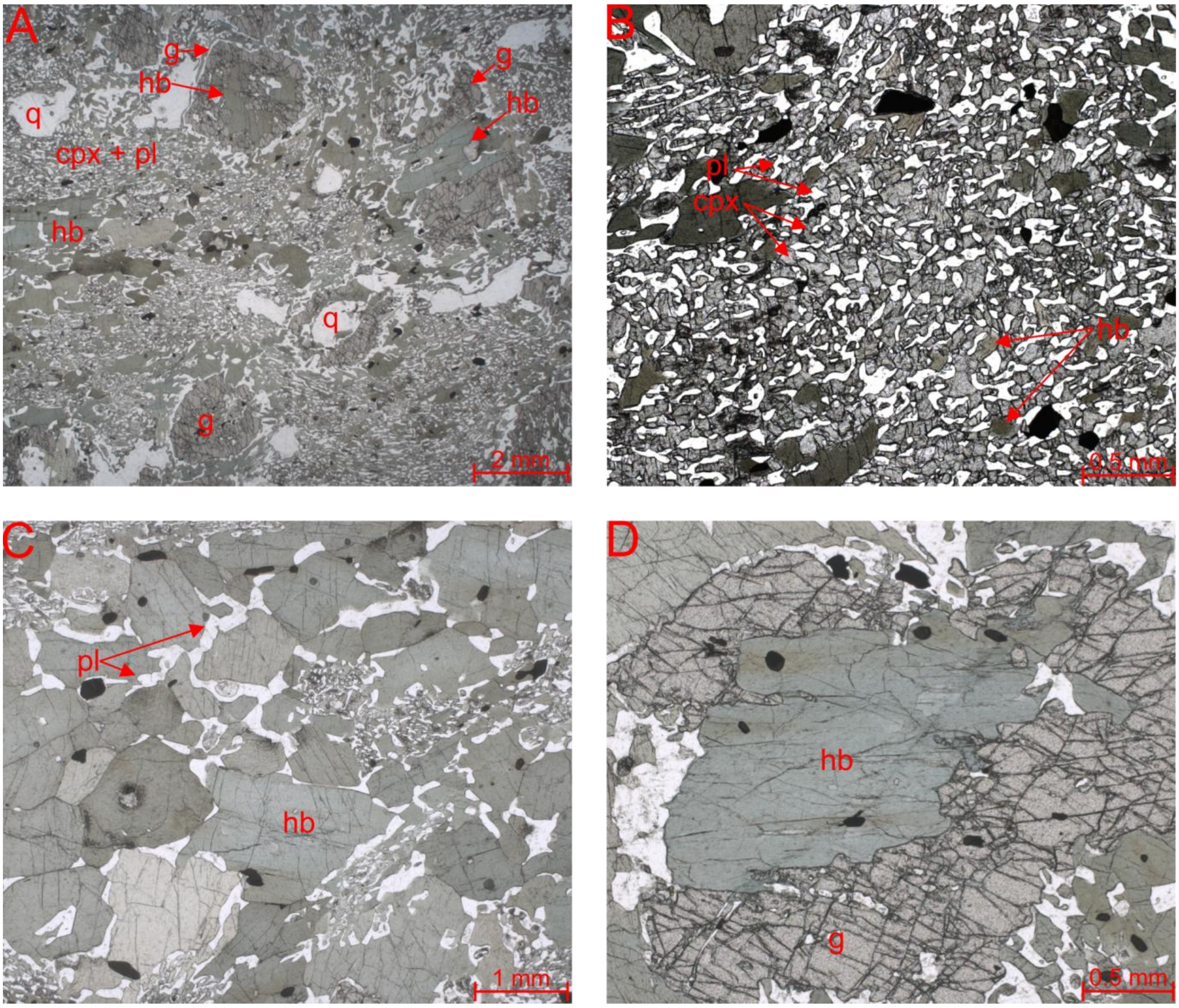

Figure 5.5. General aspects of sample SPF 03B. All plane-polarized light.

The complex types involve garnet in the intermediary or external parts of the textures. Some hornblende crystals are mantled by garnet, which is, in turn, mantled by plagioclase-hornblende coronas. This type of texture may include thin plagioclase films between the inner hornblende and garnet (Figures 5.6e, f).

The remaining type of texture forms around quartz crystals or quartz aggregates, which are mantled by plagioclase and by discontinuous layers of hornblende of variable thickness (0.1-0.2 mm). This is followed by a discontinuous layer of garnet, which is generally mantled by plagioclase and hornblende, like other garnet crystals in the sample. There can be layers of plagioclase between garnet and inner hornblende layers, and discontinuous clinopyroxene layers may occur at different positions (Figures 5.6c-f).

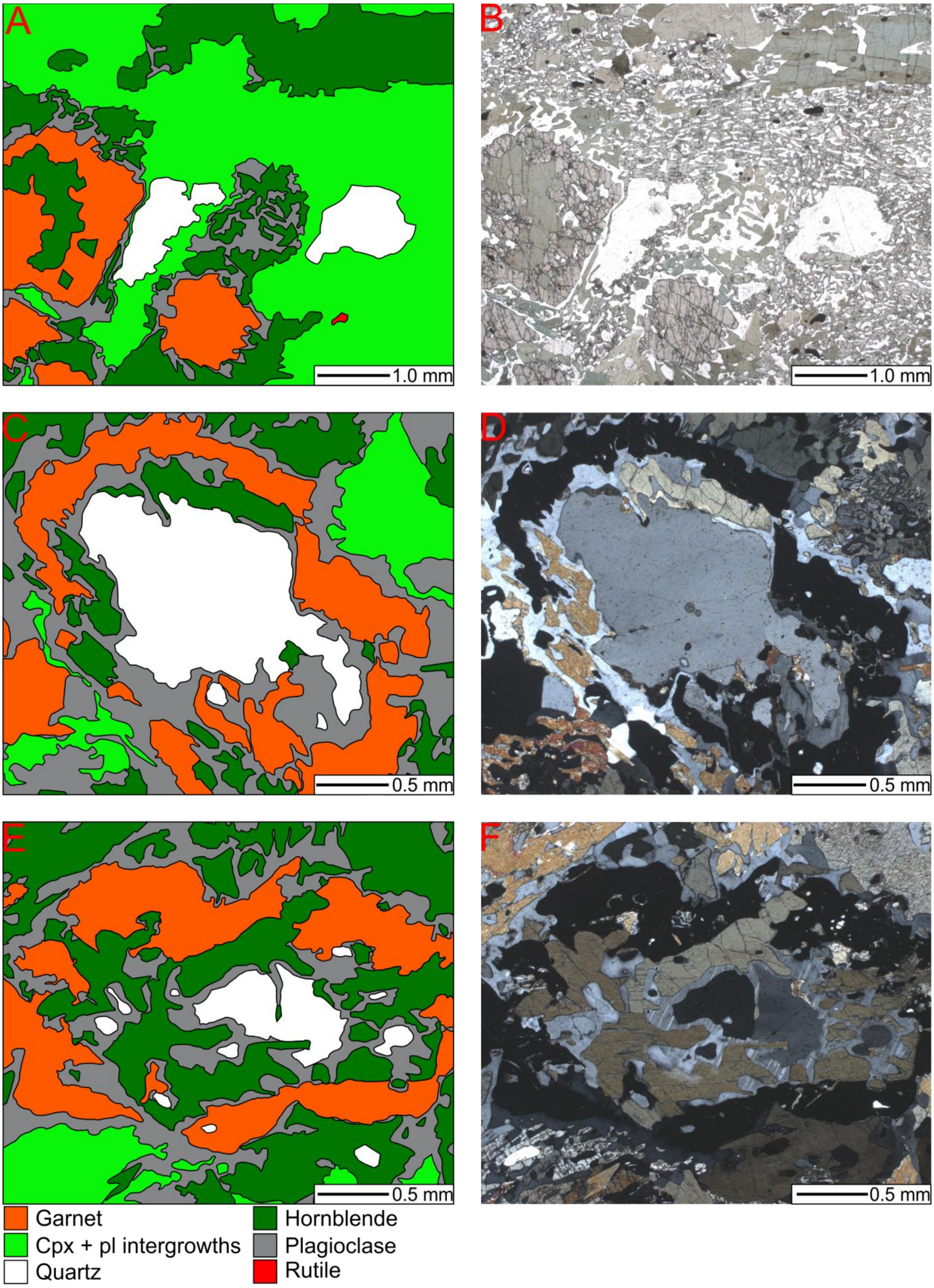

Figure 5.6. Reaction textures in sample SPF 03B, as simplified sketches (*a*, *c* and *e*, left-hand side) and as photomicrographs (right-hand side; *b*: plane-polarized light. *d* and *f*: cross-polarized light).

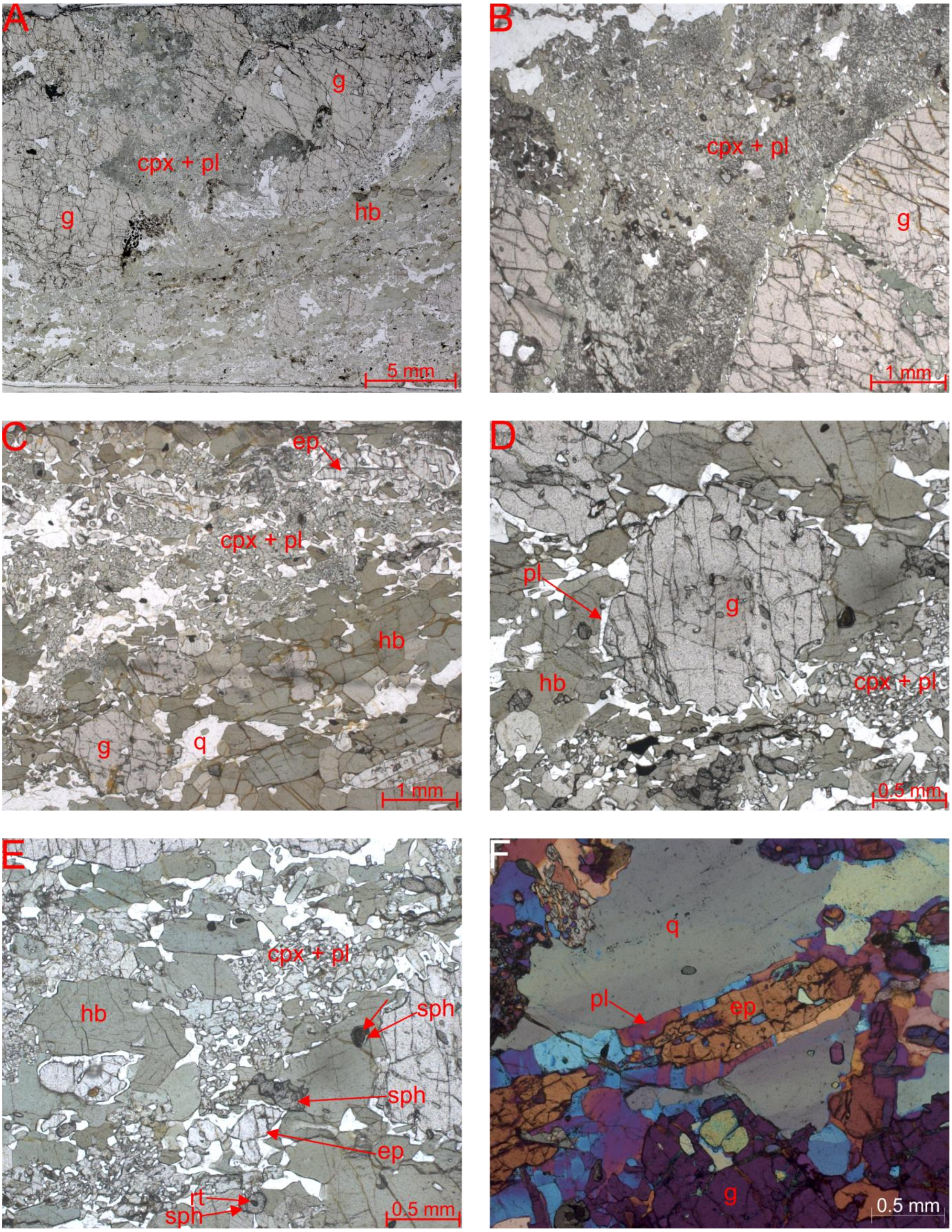

Figure 5.7. General aspects of sample SPF 01C. *a-e*: plane-polarized light. *f*: cross-polarized light with gypsum plate.

5.4.3 SPF 01C

This sample is composed of irregular, discontinuous hornblende-, clinopyroxene-, plagioclase-, and garnet-rich domains (Figure 5.7a). Garnet-rich domains are composed of centimetric garnet porphyroblasts and fine-grained clinopyroxene-plagioclase symplectites, which are very similar to SPF 03A (Figures 5.7a, b). The porphyroblasts are surrounded by plagioclase-hornblende double coronas (Figure 5.7b), except when in contact with plagioclase-rich domains, and are rich in inclusions. The inclusions correspond mainly to sphene, but can also be hornblende, rutile, opaque minerals, epidote, plagioclase, quartz and muscovite. Plagioclase may form films around inclusions of epidote and quartz, and sphene may mantle inclusions of rutile.

Clinopyroxene-rich domains are also similar to the ones from SPF 03A, with garnet porphyroblasts over a matrix composed of clinopyroxene-plagioclase symplectite. However, these domains contain epidote and more hornblende, and the coronas around garnet are more diffuse (Figures 5.7c-e). Hornblende-rich domains are composed of subidioblastic hornblende, with smaller quantities of epidote, garnet porphyroblasts, interstitial plagioclase, and clinopyroxene-plagioclase symplectite. Locally plagioclase films rim garnet, but they do not completely insolate garnet from clinopyroxene and hornblende. The boundaries between hornblende- and clinopyroxene-rich domains are irregular and diffuse. Plagioclase-rich domains are composed of subidioblastic, zoned plagioclase, quartz and epidote. Epidote is separated from quartz by plagioclase coronas (Figure 5.7f).

5.4.4 SPF 01A

The SPF 01A sample is a banded epidote-hornblende-garnet-clinopyroxene fels. The bands are millimetric and discontinuous. The two types of bands are texturally similar, presenting garnet porphyroblasts over a matrix composed mainly of clinopyroxene-plagioclase symplectite, plus variable amounts of hornblende, epidote and non-symplectite plagioclase. One of band types is richer in garnet and epidote, and has smaller garnet porphyroblasts, while the other is richer in hornblende and clinopyroxene, and has bigger garnet porphyroblasts (Figure 5.8a). Both types may present millimetric epidote-plagioclase lenses, on which epidote occurs in the center, and plagioclase occurs in the contact with the matrix.

Garnet has fewer inclusions than crystals from SPF 03A, and they are mainly quartz and sphene. Sometimes plagioclase-hornblende coronas occur around garnet, but they are never as well-defined as the ones observed at SPF 03A sample, and garnet may also occur in contact with clinopyroxene (Figure 5.8b).

As in SPF 03A, clinopyroxene-plagioclase symplectites can be divided in two textural types, in this case one with thinner intergrowths and higher area density of them, and another where the reverse occurs. The differences between the two generations are not as pronounced as in SPF 03A. Crystals from the two generations can occur together with irregular contact. Plagioclase also occurs unrelated to symplectite, as an interstitial phase, or as discrete crystals in the matrix, which are subidioblastic, chemically zoned, and sometimes have polygonal contacts (Figure 5.8c). Hornblende occurs as subidioblastic crystals in the matrix or as patches in clinopyroxene, as described on SPF 03A. Rutile occurs as subidioblastic crystals, usually rimmed by sphene crystals (Figure 5.8d). Besides its occurrence in separate lenses, epidote also occurs as subidioblastic crystals in the matrix.

5.5 Mineral Chemistry

Mineral chemistry data were obtained for each rock type. The analyses were performed at the Electron Microprobe Laboratory of the NAP Geoanalítica - Institute of Geosciences/University of São Paulo using a Jeol JXA-FE-8530. The analyses were carried on using 15 kV acceleration voltage and 20 nA probe current, with probe diameter of 5 µm for all minerals except plagioclase, for which at most analysis 10 µm probe diameter was used. A range of synthetic and natural mineral standards was employed for element calibration. For clinopyroxene and garnet Fe^{3+} was estimated using the method described by Droop (1987), while for amphiboles the method of Schumacher (described in Leake *et al.*, 1997) was used. Representative analyses are shown in tables 5.2-5.5.

Compositional maps were obtained for three areas in two of the samples. These were obtained at the Electron Microprobe Laboratory of Institute of Geosciences and Exact Sciences/São Paulo State University, and processed using the software ImageJ (Schindelin *et al.*, 2012; Rueden *et al.*, 2017). A set of representative maps is shown (Figures 5.9, 5.10), including, for each area, RGB compositions of Na_2O, CaO and FeO (Figures 5.9a-c) to help the reader distinguish the different phases in each area.

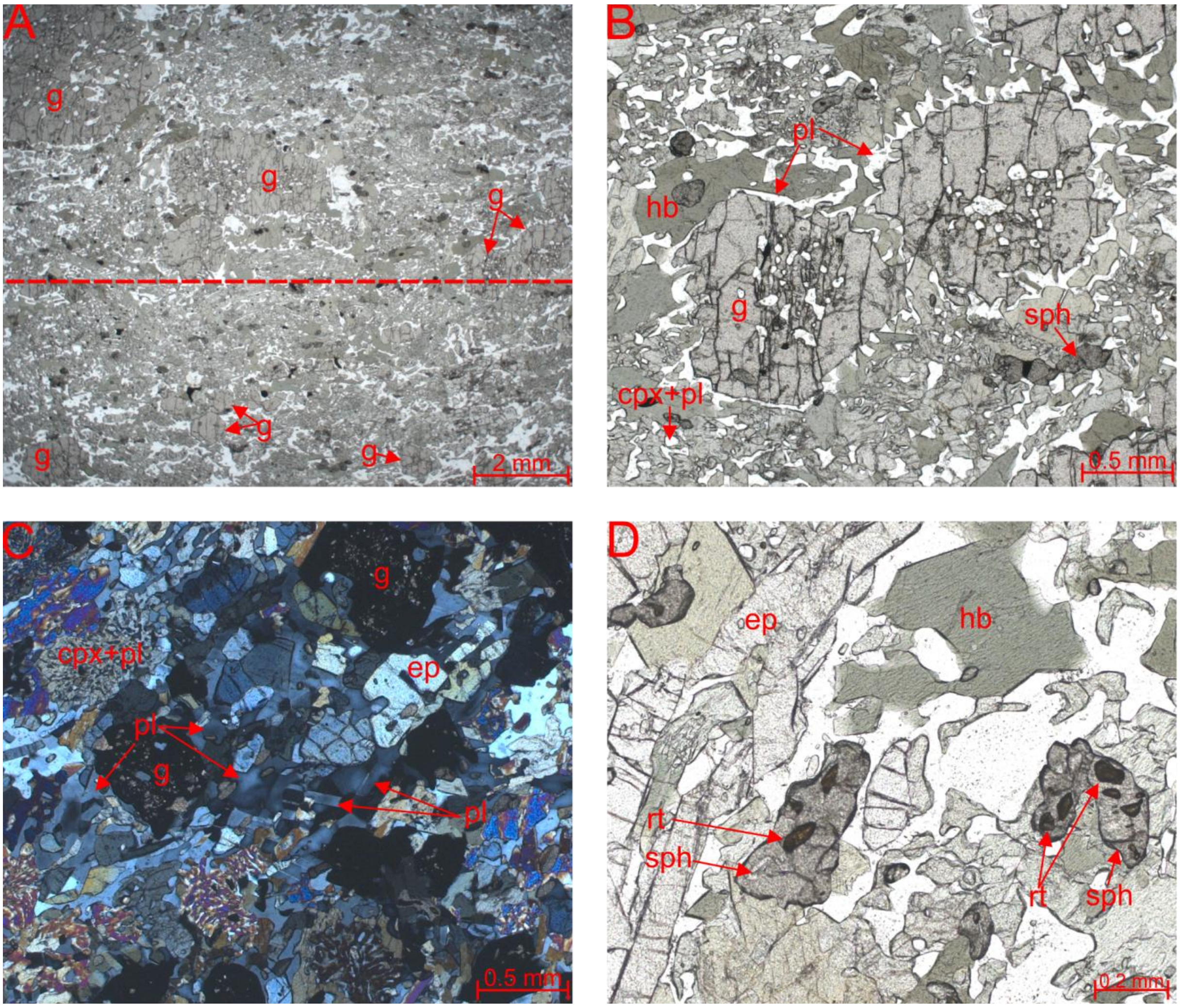

Figure 5.8. General aspect of sample SPF 01A. *a*, *b* and *d*: plane-polarized light. The dotted red line on *a* marks the approximate boundary between two types of bands. *c*: cross-polarized light.

5.5.1 Clinopyroxene

Clinopyroxene compositions do not vary very much in the study samples. Most analysis classify as diopside, and a handful as omphacite, the maximum jadeite content being 18% (Figure 5.11a). Despite this, there are differences in the data from the different samples. Clinopyroxene from SPF 01C and SPF 01A have Mg/(Mg+Fe^{2+}) between 0.75 and 0.85 and Na is generally below 0.15 apfu. In sample SPF 01A it can be noted that the analysis from symplectites richer in plagioclase are slightly richer in Mg. For sample SPF 01C, crystals poorer in plagioclase intergrowths can display higher Na, above 0.15 apfu (Figure 5.11b-d).

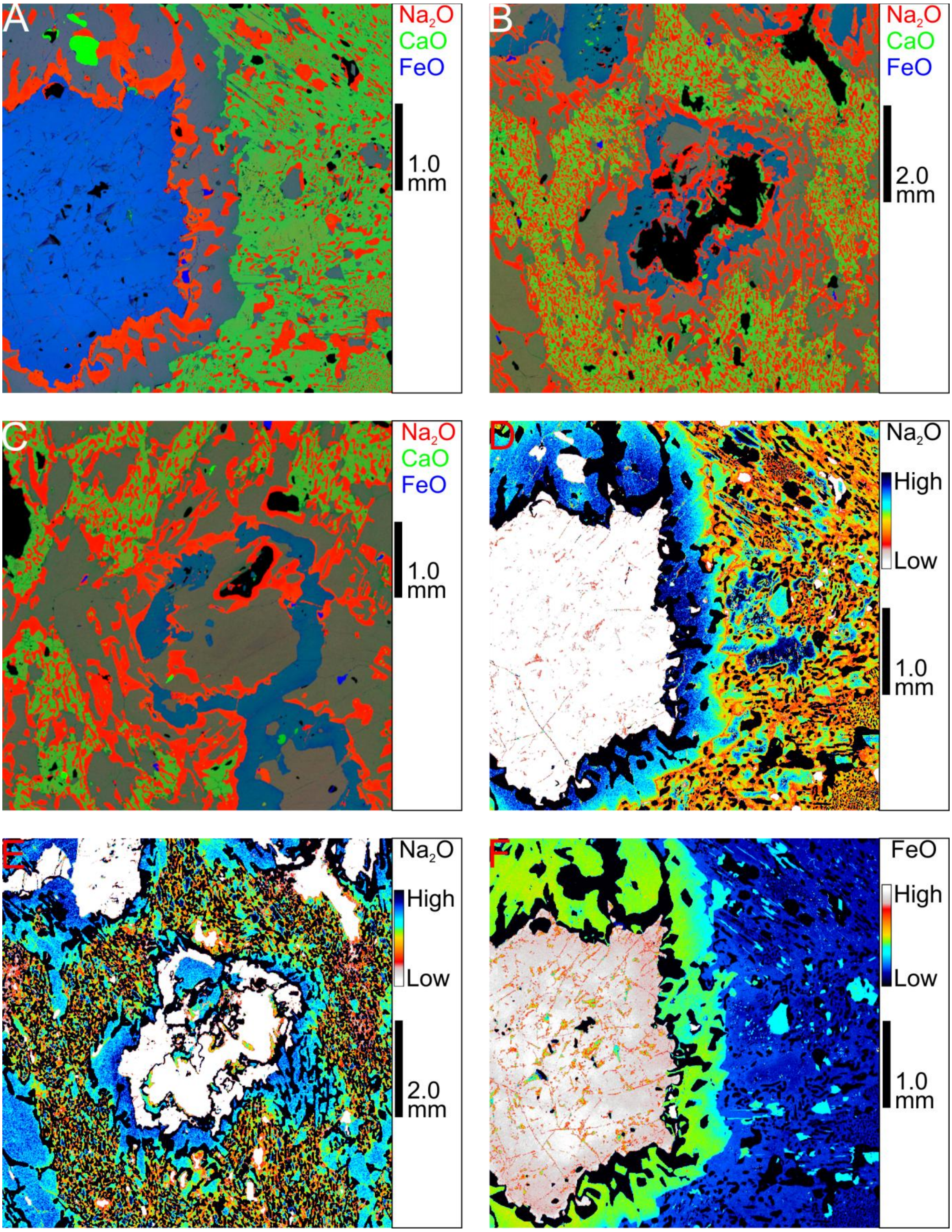

Figure 5.9. WDS compositional maps of selected areas of the studied samples. *a-c*: RGB compositions of each analyzed area, with Na_2O: red, CaO: green and FeO: blue. In *d-f* measured elements are indicated on the right-hand side of each map. *a*, *d*, and *f*: sample SPF 03A; *b*, *c* and *e*: sample SPF 03B.

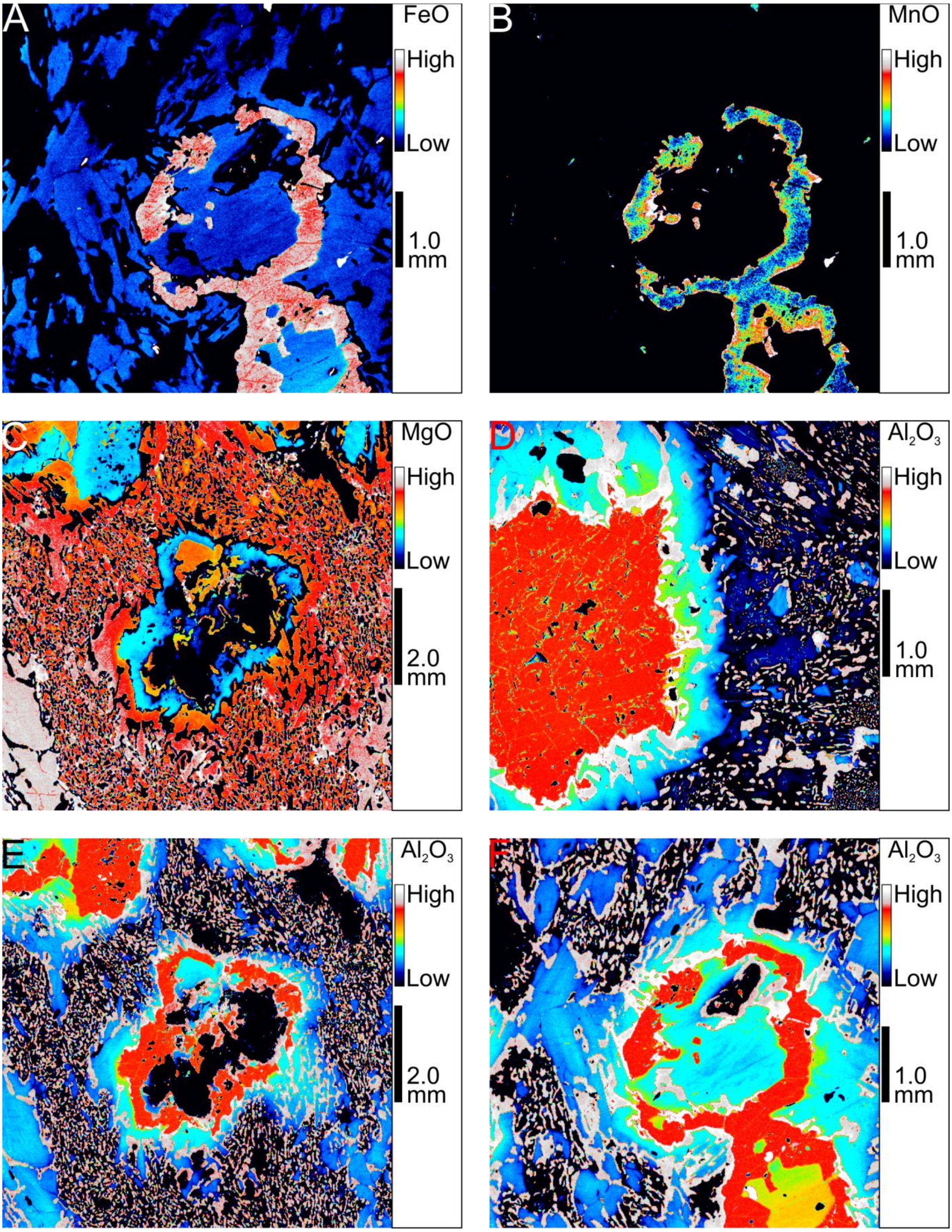

Figure 5.10. WDS compositional maps of selected areas of the studied samples. Measured elements are indicated on the right-hand side of each map. All images are from SPF 03B, except for *d*.

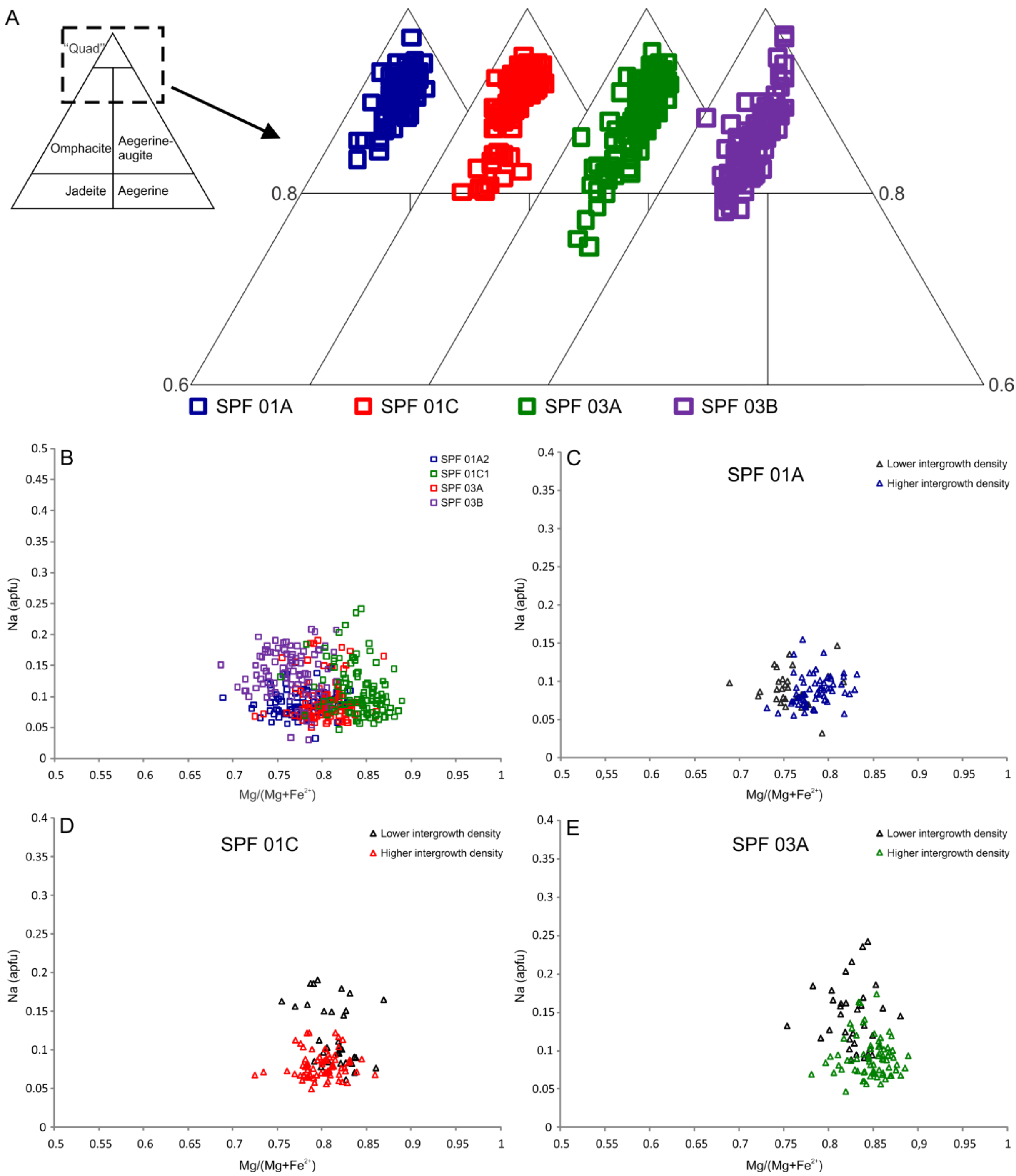

Figure 5.11. Chemical composition of clinopyroxene from the study samples.

Table 5.2. Representative analyses of clinopyroxene from the study samples. Abbreviations: *Text. cont.* - textural context; *grt rich* - garnet-rich band in SPF 01; *grt poor* - garnet-poor band in SPF 01; *high intrg* - high area density of intergrowths; *low intrg* - low area density of intergrowths; *n.d.* - below detection limit.

Sample	SPF 01A	SPF 01A	SPF 01C	SPF 01C	SPF 03A	SPF 03A	SPF 03A	SPF 03B	SPF 03B
Mineral	Clinopyroxene								
Text.cont.	grt rich	grt poor	high intrg	low intrg	high intrg	low intrg	low intrg	matrix	matrix
Point	Cpx 2.3	Cpx 6.8	Cpx 1.4	Cpx 5.4	Cpx 2.4	Cpx 5.15	Cpx 6.13	Cpx 2.5	Cpx 3.25
SiO_2	51.11	52.37	52.59	52.67	52.13	52.23	53.20	52.91	51.55
TiO_2	0.21	0.17	0.09	0.11	0.10	0.11	0.13	0.12	0.20
Al_2O_3	3.76	2.80	2.50	5.51	4.25	4.95	6.75	2.74	5.54
FeO	9.58	8.55	8.10	7.86	7.60	7.22	6.69	8.17	8.30
MnO	0.12	0.10	0.08	0.13	0.05	0.07	0.06	0.09	0.09
MgO	11.25	12.44	12.63	11.16	12.52	12.32	11.24	12.45	11.23
CaO	22.55	22.88	22.70	19.73	20.80	21.00	18.46	21.49	19.38
Na_2O	1.06	0.97	0.94	2.61	1.80	1.62	3.44	1.39	2.52
K_2O	*n.d*	*n.d*	0.03	*n.d*	0.01	*n.d*	*n.d*	*n.d*	*n.d*
Cr_2O_3	0.02	*n.d*	0.05	0.03	0.04	0.01	0.12	0.11	0.08
Total	99.66	100.28	99.70	99.81	99.30	99.54	100.09	99.47	98.89
Oxygens	6	6	6	6	6	6	6	6	6
Si	1.91	1.94	1.96	1.94	1.93	1.93	1.93	1.97	1.91
Ti	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Al	0.17	0.12	0.11	0.24	0.19	0.22	0.29	0.12	0.24
Fe^{2+}	0.22	0.20	0.20	0.17	0.15	0.18	0.11	0.21	0.15
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.63	0.69	0.70	0.61	0.69	0.68	0.61	0.69	0.62
Ca	0.90	0.91	0.91	0.78	0.82	0.83	0.72	0.86	0.77
Na	0.08	0.07	0.07	0.19	0.13	0.12	0.24	0.10	0.18
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.08	0.07	0.05	0.08	0.09	0.04	0.09	0.04	0.11
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Clinopyroxene from SPF 03A has Mg/(Mg+Fe^{2+}) slightly higher than clinopyroxene from the previous samples, and although most of the analyses have Na values similar to the them, there are a higher number with Na above 0.12-0.15 apfu (Figure 5.11e). In the compositional map (Figure 5.9d) it can be seem that higher-Na areas are irregular, and tend to occur in the larger clinopyroxene areas. Like in sample SPF 01C, in sample SPF 03A crystals from the generation with less plagioclase intergrowths present higher Na contents, in this case up to 0.24 apfu (Figure 5.11e). Crystals from SPF 03B have Na mostly between 0.1 and 0.2 apfu, going up to 0.24 apfu, and Mg/(Mg+Fe^{2+}) between 0.7 and 0.8. As in SPF 03A, some larger areas present higher Na content (Figure 5.9e).

5.5.2 Garnet

In all samples, garnet present similar chemical variations, with almandine between 45% and 60%, pyrope between 10% and 25%, grossular between 20% and 40% and spessartine <5.5% (Figure 5.12).

In sample SPF 01A, garnet crystals from different bands differ in composition, the main difference being grossular content (Figure 5.12): crystals from the garnet-rich band have grossular content usually between 34% and 39%, while than those from the garnet-poor band display grossular content between 27% and 32 %. Some crystals show a slight zoning, defined by rims with higher almandine and lower grossular content.

Sample SPF 01C is characterized by its centimetric garnet porphyroblasts. Analyses from the large porphyroblasts fall in the same range as analyses from regular-sized crystals (Figure 5.12). Regular-sized crystals show increase in almandine and grossular components toward the rims, coupled with decrease in pyrope. Large porphyroblasts display irregular zoning: there is no core-rim pattern, and composition does not seem to be affected by the presence of different inclusions.

Garnet crystals from SPF 03A are poorer in grossular and richer in pyrope relative to the previous samples, while having very similar almandine contents (Figure 5.12). They present no pattern of chemical zoning (Figure 5.9f)

Garnet from SPF 03B is similar in composition to analyzed crystals from SPF 03A, and the ones from different textural context do not present meaninful compositional differences. Crystals from coronas around hornblende and quartz display a slight zoning, with higher Fe and Mn in their rims (both inner and outer rims, see Figures 5.10a-c).

5.5.3 Hornblende

Hornblende crystals from sample SPF 01A are relatively constant in composition, regardless of textural context, presenting ^{VI}Al around 0.7 apfu, ^{IV}Al between 1.4 and 1.9 apfu, $^{A}(Na+K)$ between 0.45 and 0.65 apfu, $Mg/(Mg+Fe^{2+})$ of 0.6, ^{B}Na between 0.05 and 0.1 apfu and Ti around 0.1 apfu (Figures 5.13a, c, e). The only crystals that do not follow this pattern are two crystals included in garnet, which have higher total Al (up to 3.4 apfu).

Compositions of hornblende from sample SPF 01C are similar to compositions from SPF 01A, but more widespread, with ^{VI}Al between 0.6 and 1.0 apfu, ^{IV}Al between 1.5 and 2.1

apfu, ^{A}(Na+K) between 0.4 and 0.65 apfu, Mg/(Mg+Fe^{2+}) between 0.55 and 0.7, ^{B}Na between 0.05 and 0.17 apfu and Ti between 0.04 and 0.12 apfu (Figures 5.13b, d, f). Contrary to the previous sample, in SPF 01C, hornblende from different textural contexts shows more noticeable differences in composition: hornblende from clinopyroxene substitution textures and subidioblastic crystals from hornblende-rich domains display a higher Mg/(Mg+Fe^{2+}) than the other types (Figures 5.13b, d, f). One of the crystals included in garnet displays a markedly lower Mg/(Mg+Fe^{2+}), and also lower Ti. Despite being thin, hornblende coronas around garnet are zoned, with higher ^{IV}Al, ^{VI}Al, and ^{A}(Na+K) and lower Mg/(Mg+Fe^{2+}) towards garnet. Subidioblastic crystals do not show significant zoning.

Hornblende from sample SPF 03A presents higher composition variation in comparison with the other samples, as well as between crystals from different textural contexts. Hornblende from clinopyroxene substitution textures has ^{VI}Al between 0.2 and 0.6 apfu, ^{IV}Al between 1.1 and 1.6 apfu, ^{A}(Na+K) between 0.4 and 0.6 apfu, Mg/(Mg+Fe^{2+}) between 0.7 and 0.8, ^{B}Na between 0.06 and 0.15 apfu and Ti between 0.03 and 0.15 apfu (Figures 5.14a, c, e).

Crystals from hornblende aggregates and from coronas around garnet porphyroblasts are similar in terms of ^{IV}Al (1.0-2.2 apfu), ^{A}(Na+K) (0.4-0.75 apfu) and ^{B}Na (0.06-0.16 apfu), but differ slightly in terms of ^{VI}Al (0.4-0.8 apfu and 0.25-1.0 apfu, respectively); Mg/(Mg+Fe^{2+}) (0.7-0.83 and 0.65-0.75, respectively) and Ti (up to 0.09 apfu and up to 0.18 apfu, respectively, Figures 5.14a, c, e). Most crystals included in garnet porphyroblasts display compositions in the middle of the range of the ones in coronas, but there are abnormal compositions with higher ^{B}Na (up to 0.22 apfu) and with higher ^{A}(Na+K) and ^{IV}Al combined with regular ^{VI}Al and low Mg/(Mg+Fe^{2+}) (Figures 5.14a, c, e).

Subidioblastic crystals may show a slight zoning, with higher ^{IV}Al, ^{VI}Al, and ^{A}(Na+K) and lower Mg/(Mg+Fe^{2+}) at the rims, and hornblende form coronas around garnet display the same pattern described for SPF 01C (see Figure 5.10d).

In general terms, compositions from sample SPF 03B are similar to those from SPF 03A, although less widespread and with noticeable higher Mg/(Mg+Fe^{2+}). This similarity includes crystals from the same textural context having compositions in roughly the same range in both samples (Figures 5.14a-f). Crystals that are mantled by garnet have ^{VI}Al between 0.4 and 1.0 apfu, ^{IV}Al between 1.5 and 2.2 apfu, ^{A}(Na+K) between 0.5 and 0.7 apfu, Mg/(Mg+Fe^{2+}) between 0.55 and 0.75 Ti between 0.05 and 0.15 apfu and ^{B}Na ≈ 0.15 apfu

(Figures 5.14b, d, f). Hornblende in the complex textures present higher Na, Al and Fe near garnet, similar to what is observed in the previous samples (Figures 5.10e, f).

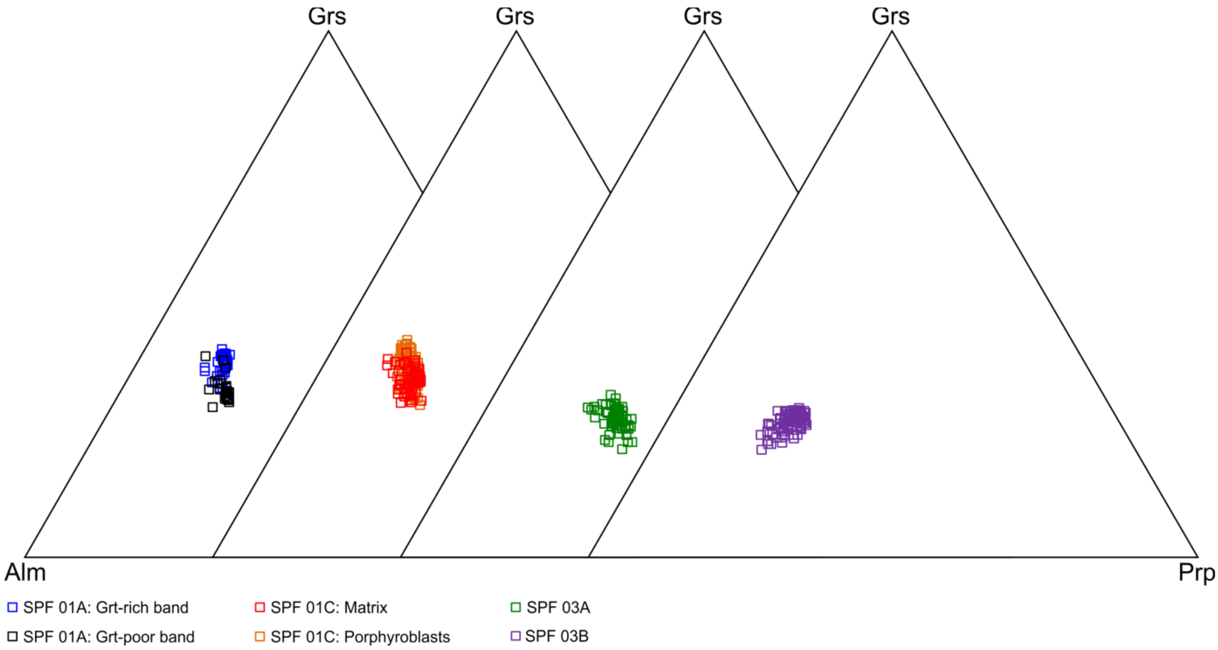

Figure 5.12. Chemical composition of garnet from the study samples.

Table 5.3. Representative analyses of garnet from the study samples. Abbreviations: *Text. cont.* - textural context; *grt rich* and *grt poor* - garnet-rich/poor bands in SPF 01A; *mant hb* mantles around hornblende; *lg phbl* - large porphyroblasts in SPF 01C; porphybl - regular sized porphyroblasts; *n.d.* - below detection limit.

Sample	SPF 01A	SPF 01A	SPF 01C	SPF 01C	SPF 03A	SPF 03A	SPF 03A	SPF 03B	SPF 03B
Mineral	Garnet								
Text.cont.	grt rich	grt poor	lg phbl	porphyb	porphybl	porphybl	porphybl	mant hb	porphybl
Point	Grt 2.5	Grt 7.5	Grt 1.12	Grt 3.13	Grt 2.5	Grt 3.13	Grt 4.7	Grt 1.4	Grt 7.6
SiO_2	38.69	38.93	38.62	38.86	38.82	37.80	38.90	38.56	38.84
TiO_2	0.26	0.11	0.26	0.02	0.07	0.06	0.05	0.12	0.06
Al_2O_3	21.60	21.98	21.60	21.73	22.07	21.59	21.89	21.78	21.99
FeO	22.14	23.46	22.38	22.76	23.90	24.62	22.74	24.62	24.38
MnO	0.66	0.53	1.05	1.17	0.25	0.80	0.50	0.78	0.46
MgO	3.44	4.34	3.15	3.89	5.65	5.41	5.61	4.90	5.30
CaO	14.04	11.86	13.78	12.33	9.85	8.52	10.69	9.79	9.62
Cr_2O_3	0.05	0.02	0.01	0.07	0.09	0.02	*n.d.*	0.02	0.03
Total	100.88	101.23	100.85	100.83	100.70	98.82	100.38	100.57	100.68
Oxygens	12	12	12	12	12	12	12	12	12
Si	2.99	2.99	2.99	3.00	2.98	2.97	2.99	2.98	2.99
Ti	0.02	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.00
Al	1.97	1.99	1.97	1.98	2.00	2.00	1.98	1.99	2.00
Fe^{2+}	1.39	1.48	1.42	1.45	1.50	1.56	1.43	1.55	1.56
Mn	0.04	0.03	0.07	0.08	0.02	0.05	0.03	0.05	0.03
Mg	0.40	0.50	0.36	0.45	0.65	0.63	0.64	0.57	0.61
Ca	1.16	0.98	1.14	1.02	0.81	0.72	0.88	0.81	0.79
Cr	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Fe^{3+}	0.04	0.03	0.03	0.02	0.03	0.06	0.03	0.04	0.02
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

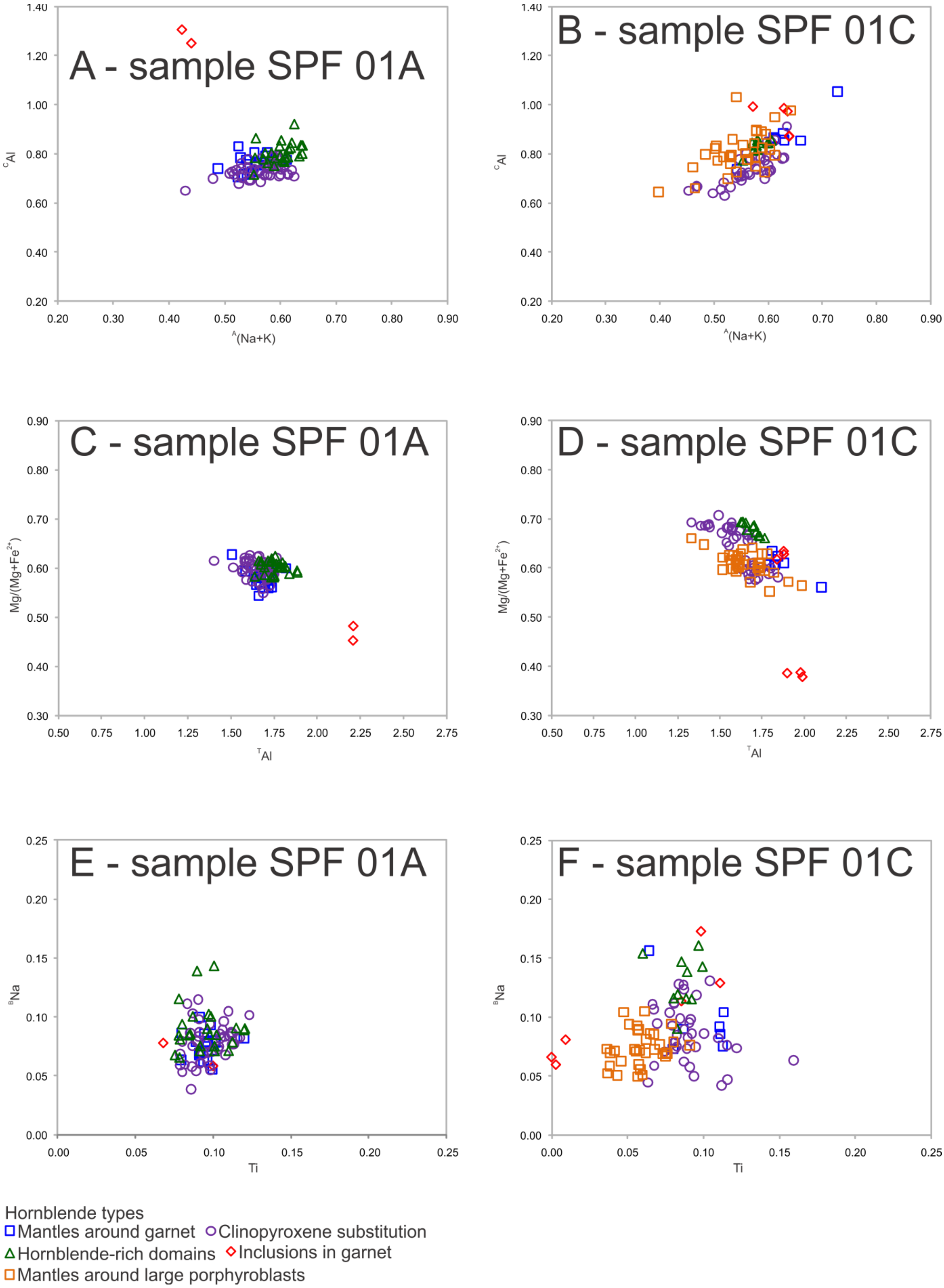

Figure 5.13. Chemical composition of amphibole from samples SPF 01A (*a*, *c* and *e*) and SPF 01C (*b*, *d*, and *f*).

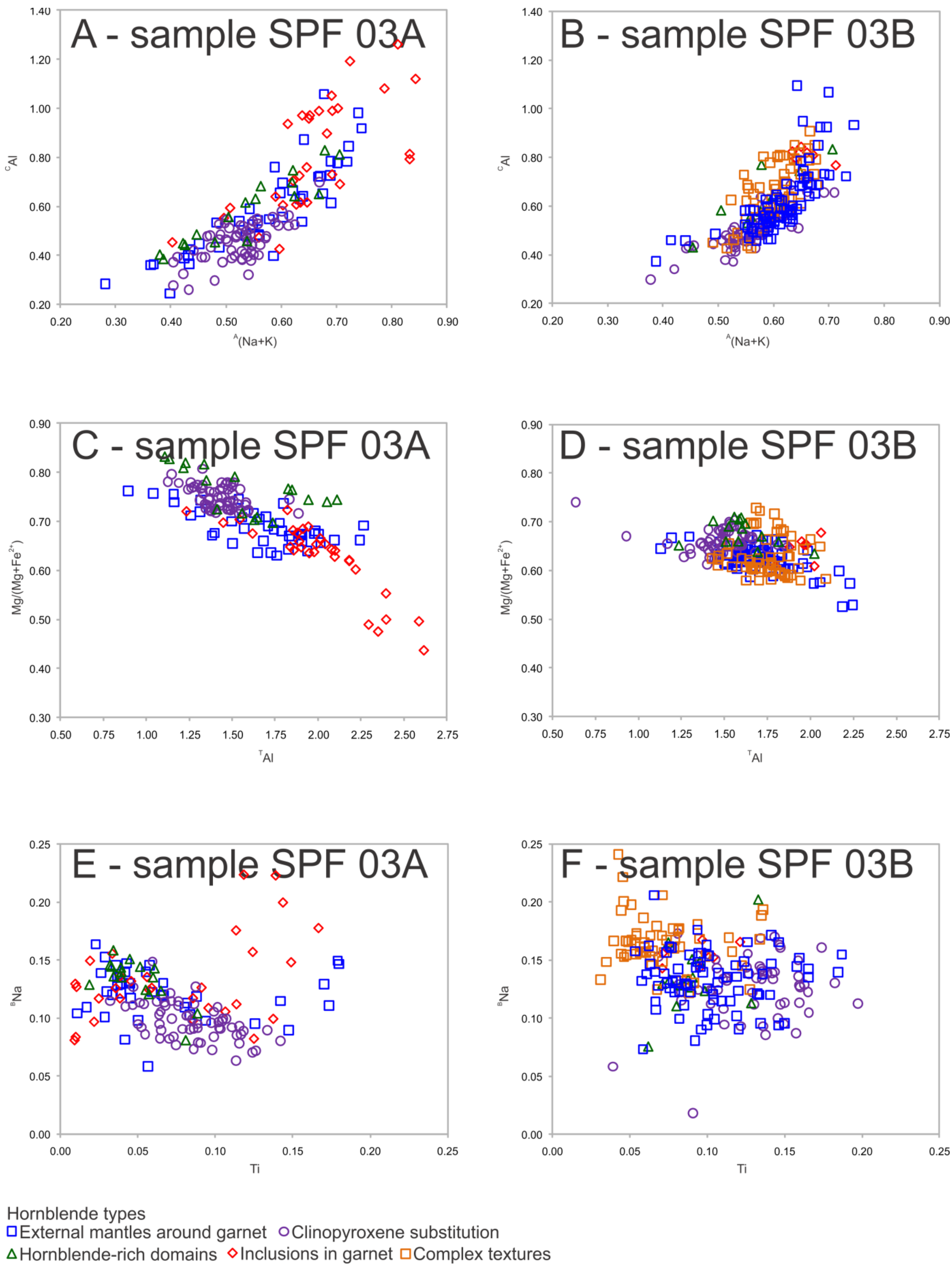

Figure 5.14. Chemical composition of amphibole from samples SPF 03A (*a*, *c* and *e*) and SPF 03B (*b*, *d*, and *f*).

Table 5.4. Representative analyses of amphibole from the study samples. Abbreviations: *Text. cont.* - textural context; *cpx sub* - clinopyroxene substation; *mant grt* - mantles around garnet; *incl grt* - inclusions in garnet; *hbl agg* - hornblende aggregates.

Sample	SPF 01A	SPF 01A	SPF 01A	SPF 01C	SPF 01C	SPF 01C	SPF 01C	SPF 01C	SPF 03A
Mineral	Amphibole								
Text. Cont.	mant grt	cpx sub	hbl agg	mant grt	mant grt	cpx sub	hbl agg	incl grt	mant grt
Point	Hbl 1.5	Hbl 4.8	Hbl 5.5	Hbl 5.4	Hbl 6.9	Hbl 6.16	Hbl 10.1	Hbl 4.2	Hbl 4.12
SiO_2	42.85	43.66	42.83	43.29	43.96	45.71	43.14	42.18	46.25
TiO_2	0.86	0.79	1.02	0.59	0.72	0.75	0.76	0.90	0.34
Al_2O_3	14.36	13.16	14.67	14.86	14.00	12.24	15.31	15.72	10.33
FeO	15.95	15.11	15.08	14.52	14.56	12.20	12.95	14.38	13.53
MnO	0.11	0.11	0.10	0.14	0.16	0.08	0.07	0.12	0.07
MgO	10.16	11.06	10.51	10.86	11.05	13.13	11.92	10.77	13.85
CaO	11.84	11.82	11.87	11.78	11.80	12.10	11.84	11.08	11.27
Na_2O	1.99	1.94	1.96	1.76	1.82	1.56	1.89	2.20	1.97
K_2O	0.43	0.47	0.66	0.66	0.61	0.58	0.87	1.01	0.18
Cr_2O_3	0.11	0.01	0.05	0.06	0.06	0.09	0.04	0.03	0.04
Total:	98.66	98.12	98.75	98.52	98.74	98.44	98.78	98.38	97.92
Oxygens	23	23	23	23	23	23	23	23	23
Si	6.28	6.41	6.26	6.31	6.39	6.59	6.24	6.16	6.69
Ti	0.10	0.09	0.11	0.06	0.08	0.08	0.08	0.10	0.04
Al	2.48	2.28	2.53	2.55	2.40	2.08	2.61	2.71	1.76
Fe^{2+}	1.70	1.61	1.65	1.52	1.56	1.29	1.32	1.46	1.16
Mn	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01
Mg	2.22	2.42	2.29	2.36	2.40	2.82	2.57	2.35	2.99
Ca	1.86	1.86	1.86	1.84	1.84	1.87	1.83	1.73	1.75
Na	0.57	0.55	0.56	0.50	0.51	0.44	0.53	0.62	0.55
K	0.08	0.09	0.12	0.12	0.11	0.11	0.16	0.19	0.03
Cr	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Fe^{3+}	0.25	0.24	0.19	0.25	0.21	0.18	0.24	0.30	0.47
Total	15.57	15.56	15.60	15.53	15.53	15.47	15.60	15.64	15.45

Table 5.4 (continued). Representative analyses of amphibole from the study samples. Abbreviations: *Text. cont.* - textural context; *cpx sub* - clinopyroxene substation; *mant grt* - mantles around garnet; *incl grt* - inclusions in garnet; *hbl agg* - hornblende aggregates; *cpl txt* - complex textures.

Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Mineral	Amphibole								
Text. Cont.	mant grt	cpx sub	hbl agg	incl grt	mant grt	mant grt	cpx sub	hbl agg	cpl text
Point	Hbl 8.25	Hbl 5.7	Hbl 6.1	Hbl 8.13	Hbl 5.13	Hbl 3.9	Hbl 2.16	Hbl 11.6	Hbl 9.20
SiO_2	38.95	47.85	46.39	36.51	46.36	42.12	45.36	42.51	43.89
TiO_2	0.72	0.63	0.75	0.08	0.53	0.81	1.01	0.68	0.44
Al_2O_3	18.36	8.85	10.67	17.24	9.54	15.33	10.51	14.94	11.15
FeO	13.27	10.57	10.27	20.13	13.72	14.10	14.36	14.38	16.81
MnO	0.10	0.04	0.04	0.09	0.08	0.08	0.08	0.09	0.09
MgO	11.13	15.77	15.37	7.15	12.98	11.44	12.68	11.72	11.71
CaO	11.38	11.64	12.03	11.15	11.84	11.06	11.47	10.93	10.66
Na_2O	2.80	1.75	1.88	2.85	1.61	2.69	2.02	2.73	2.40
K_2O	0.30	0.15	0.21	0.29	0.15	0.23	0.14	0.23	0.20
Cr_2O_3	0.06	0.01	0.11	0.02	0.07	0.11	0.08	0.06	0.03
Total:	97.29	97.39	97.82	97.46	96.98	97.97	97.71	98.46	97.82
Oxygens	23	23	23	23	23	23	23	23	23
Si	5.73	6.87	6.65	5.65	6.81	6.15	6.63	6.18	6.48
Ti	0.08	0.07	0.08	0.01	0.06	0.09	0.11	0.07	0.05
Al	3.19	1.50	1.80	3.14	1.65	2.64	1.81	2.56	1.94
Fe^{2+}	1.09	0.95	0.91	1.82	1.42	1.34	1.45	1.32	1.48
Mn	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.44	3.38	3.28	1.65	2.84	2.49	2.76	2.54	2.58
Ca	1.79	1.79	1.85	1.85	1.86	1.73	1.80	1.70	1.69
Na	0.80	0.49	0.52	0.85	0.46	0.76	0.57	0.77	0.69
K	0.06	0.03	0.04	0.06	0.03	0.04	0.03	0.04	0.04
Cr	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Fe^{3+}	0.54	0.32	0.32	0.79	0.27	0.38	0.31	0.43	0.59
Total	15.74	15.40	15.46	15.83	15.41	15.64	15.49	15.65	15.56

5.5.4 Plagioclase

In sample SPF 01A crystals from different textural contexts show very similar compositions (An_{12-30}). Subidioblastic crystals are zoned, with sodic cores (An_{12-25}), and calcic rims (An_{20-30}) (Figure 5.15). In sample SPF 01C there is a tendency of plagioclase intergrown with clinopyroxene to show lower anorthite content (An_{18-28}) than plagioclase from films around garnet (An_{25-34}). It can be seen optically that films around garnet are zoned; in the few cases where it was possible to perform more than one analysis along the width of a film, the analyses show the center of the film to have lower anorthite contents. Subidioblastic crystals show increasing anorthite contents towards contacts with epidote.

Plagioclase from sample SPF 03A is similar in composition to plagioclase from SPF 01C, with plagioclase intergrown with clinopyroxene presenting lower anorthite contents (An_{17-27}) than plagioclase from films around garnet (An_{20-31}). Interstitial crystals from hornblende-rich domains are relatively sodic (An_{17-21}) (Figure 5.16). In the compositional map, it can be seen that the films around garnet are zoned, with centers with lower anorthite content (Figure 5.10d).

In sample SPF 03B, plagioclase intergrown with clinopyroxene have compositions in the range An_{11-17}, while plagioclase from films around garnet tend to be less sodic (Figure 5.16) but span a larger compositional spectrum (An_{11-25}.). Interstitial crystals from hornblende aggregates are more sodic than crystals intergrown with clinopyroxene (An_{15-24}) (Figure 5.16). Similar to the previous samples, films around garnet and in the other reaction textures are zoned, with sodic centers and calcic borders (Figures 5.10e, f).

5.5.5 Epidote

Epidote is found only on samples SPF 01A and SPF 01C. All analyses are very close to the ideal composition $Ca_2Al_2(AlFe^{3+})Si_3O_8(OH)$, with only Al and Fe^{3+} presenting significant variation. No attempt was made to calculate or determine Fe^{2+} contents. In both samples matrix crystals present relatively high Fe^{3+} contents (0.35-0.5 apfu) while crystals from plagioclase-rich domains (in SPF 01C) and from epidote- and plagioclase-rich bands (in SPF01A) present lower Fe^{3+} (0.1-0.2 apfu). Two crystals from plagioclase-rich domains in SPF 01C deviate from the tendency, presenting Fe^{3+} values comparable to those of matrix crystals.

Table 5.5. Representative analyses of plagioclase from the study samples. Abbreviations: *Text. cont.* - textural context; *symp* – clinopyroxene-plagioclase symplectites; *mant grt* - mantles around garnet; *subd* - subidioblastic crystals; *mant ep* - mantles around epidote.; *n.d.* - below detection limit.

Sample	SPF 01A	SPF 01A	SPF 01A	SPF 01A	SPF 01A	SPF 01C	SPF 01C	SPF 01C	SPF 01C	SPF 01C	SPF 03A	SPF 03A
Mineral	Plagioclase											
Text. Cont.	mant grt	mant grt	symp	subd	subd	mant grt	mant grt	symp	subd	mant ep	mant grt	mant grt
Point	Plg 5.2	Plg 8.1	Plg 5.17	Plg 13.2	Plg 6.6	Plg 11.11	Plg 10.4	Plg 9.14	Plg 4.4	Plg 3.8	Plg 9.3	Plg 8.14
SiO_2	62.17	59.83	60.16	64.63	61.03	63.49	61.54	62.41	61.87	63.40	61.64	59.42
TiO_2	0.05	*n.d.*	*n.d.*	0.03	0.02	*n.d.*	0.01	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*
Al_2O_3	24.06	25.50	25.76	22.71	24.78	23.63	25.20	24.38	24.89	23.78	24.42	26.25
FeO	0.10	0.29	0.30	0.06	0.19	0.16	0.04	0.10	0.15	0.05	0.18	0.15
MnO	0.01	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	4.82	6.49	6.25	3.12	5.47	4.40	6.01	5.16	5.71	4.56	4.82	7.05
Na_2O	9.11	7.66	7.79	9.66	8.40	9.00	8.23	8.58	8.23	8.92	8.79	7.64
K_2O	0.13	0.06	0.11	0.15	0.10	0.13	0.18	0.17	0.09	0.28	0.07	0.06
BaO	0.02	0.14	*n.d.*	0.02	0.04	*n.d.*	*n.d.*	0.05	0.04	*n.d.*	0.09	0.01
SrO	0.05	0.03	0.06	0.09	0.06	0.03	0.02	0.07	0.11	0.03	0.11	0.17
Total	100.52	100.01	100.43	100.47	100.09	100.84	101.23	100.95	101.10	101.02	100.13	100.75
Oxygens	8	8	8	8	8	8	8	8	8	8	8	8
Si	2.75	2.67	2.67	2.84	2.71	2.79	2.70	2.74	2.72	2.78	2.73	2.64
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.25	1.34	1.35	1.17	1.30	1.22	1.30	1.26	1.29	1.23	1.28	1.37
Fe^{2+}	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.23	0.31	0.30	0.15	0.26	0.21	0.28	0.24	0.27	0.21	0.23	0.34
Na	0.78	0.66	0.67	0.82	0.72	0.77	0.70	0.73	0.70	0.76	0.76	0.66
K	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.02	5.00	5.00	5.00	5.01	4.99	5.00	5.00	4.99	5.00	5.01	5.01

Table 5.5 (continued). Representative analyses of plagioclase and epidote from the study samples. Abbreviations: *Text. cont.* - textural context; *symp* - clinopyroxene-plagioclase symplectites; *hbl agg* - hornblende aggregates; *ass grt* - associated to garnet in complex textures; *ep band* - epidote-rich bands; *incl grt* - included in garnet; *n.d.* - below detection limit; *n.a.* - not analyzed. In all analyses Fe is total iron, but it was considered as FeO for plagioclase and as Fe_2O_3 for epidote, hence the lables "FeO/Fe_2O_3" and "Fe^{2+}/Fe^{3+}" in the lines.

Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 01A	SPF 01A	SPF 01C	SPF 01C
Mineral	Plagioclase								Epidote			
Text. Cont.	symp	symp	hbl agg	ass grt	ass grt	ass grt	symp	hbl agg	ep band	matrix	matrix	incl grt
Point	Plg 1.6	Plg 5.5	Plg 6.2	Plg 6.2	Plg 8.3	Plg 6.6	Plg 4.8	Plg 5.3	Ep 4.1	Ep 1.8	Ep 3.7	Ep 5.2
SiO_2	63.04	62.28	62.87	63.94	63.62	60.44	63.64	63.08	38,92	38,51	38,98	38,15
TiO_2	0.00	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	0.01	0.05	0,04	0,13	0,04	0,18
Al_2O_3	23.76	24.03	23.50	23.24	23.72	24.91	23.25	23.77	32,15	28,86	32,43	28,86
FeO/Fe_2O_3	0.11	0.13	0.06	0.07	0.08	0.24	0.17	0.05	3,04	7,17	2,82	6,46
MnO	*n.d.*	*n.d..*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0,01	0,03	0,04	0,02
MgO	*n.d.*	*n.d..*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	4.53	4.63	3.66	3.50	4.29	5.51	3.62	4.13	24,32	23,81	24,35	23,09
Na_2O	9.16	8.93	9.40	9.66	9.13	7.97	9.39	9.21	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	0.08	0.07	0.06	0.03	0.05	0.06	0.11	0.04	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.01	*n.d..*	0.03	0.02	0.05	0.03	0.08	0.01	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	0.11	0.14	0.09	0.02	0.03	0.08	0.04	0.06	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.79	100.23	99.67	100.50	100.96	99.25	100.31	100.41	98,48	98,51	98,66	96,79
Oxygens	8	8	8	8	8	8	8	8	12.5	12.5	12.5	12.5
Si	2.77	2.76	2.79	2.81	2.79	2.71	2.80	2.78	2,96	2,97	2,96	2,99
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,00	0,01	0,00	0,01
Al	1.23	1.25	1.23	1.20	1.22	1.31	1.21	1.23	2,88	2,63	2,90	2,66
Fe^{2+}/Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0,17	0,42	0,16	0,38
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,00	0,00	0,00	0,00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,00	0,00	0,00	0,00
Ca	0.21	0.22	0.17	0.16	0.20	0.26	0.17	0.19	1,98	1,97	1,98	1,94
Na	0.78	0.77	0.81	0.82	0.78	0.69	0.80	0.79	0,00	0,00	0,00	0,00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0,00	0,00	0,00	0,00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,00	0,00	0,00	0,00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,00	0,00	0,00	0,00
Total	5.01	5.01	5.01	5.01	5.00	4.99	5.00	5.00	8,01	8,00	8,01	7,98

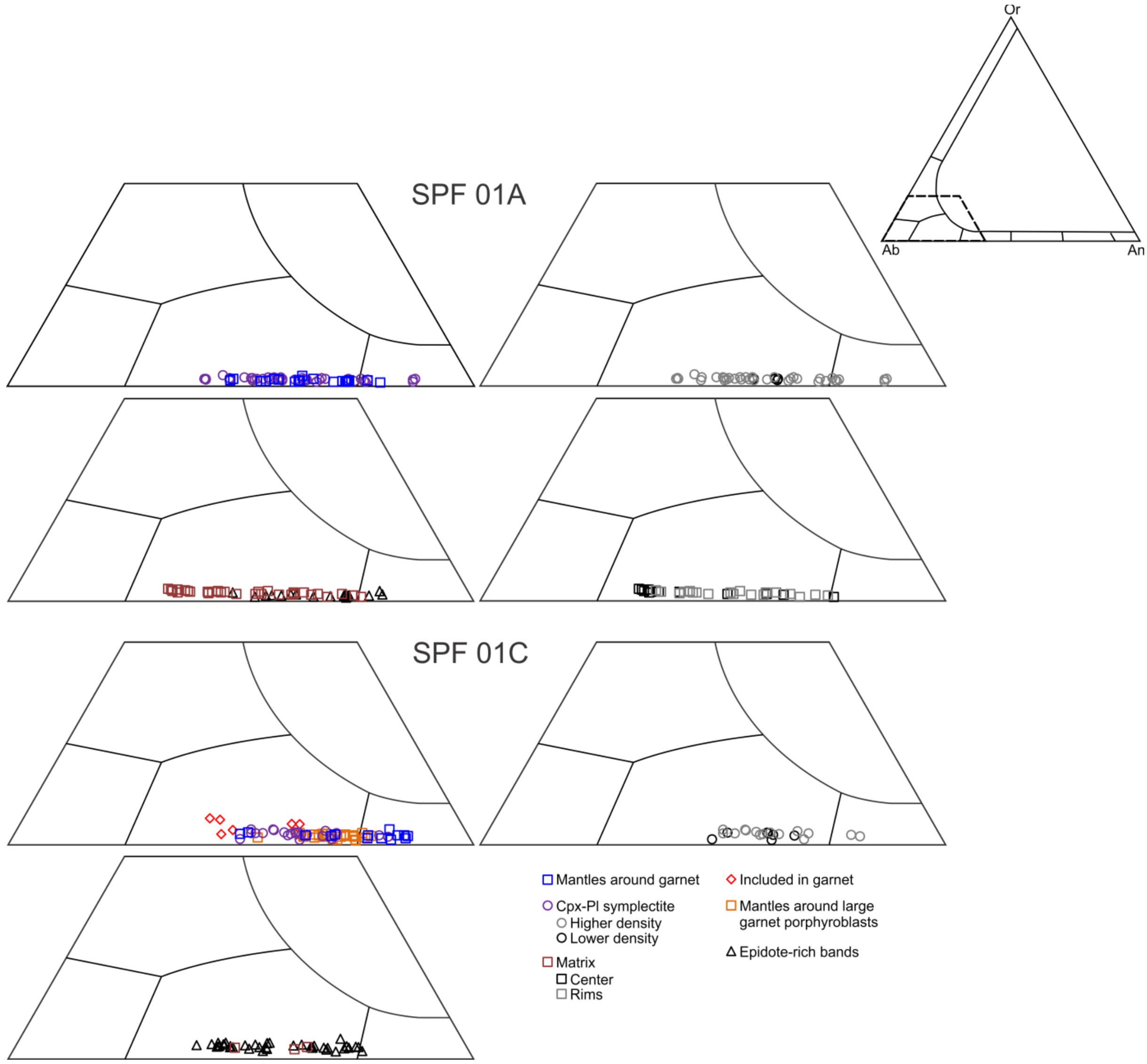

Figure 5.15. Chemical composition of plagioclase from samples SPF 01A and SPF 01C.

5.6 Thermodynamic Modelling

The prevalence of reaction textures in a rock means that methods based on the bulk composition are unsuitable, as no equilibrium assemblage was developed. However, they are still useful as an "ideal model" to be used as guide to metamorphic reactions and steps. Phase diagrams were constructed using the compositions of samples SPF 01A and SPF 03A (Figures 5.17, 5.18), using THERMOCALC (Powell & Holland, 1988) version 3.45, the internally consistent dataset 6.2 (updated at Febuary 6^{th}, 2012) of Holland & Powell (2011) and the activity-composition models presented by Green *et al.* (2016), White *et al.* (2014a) and references therein.

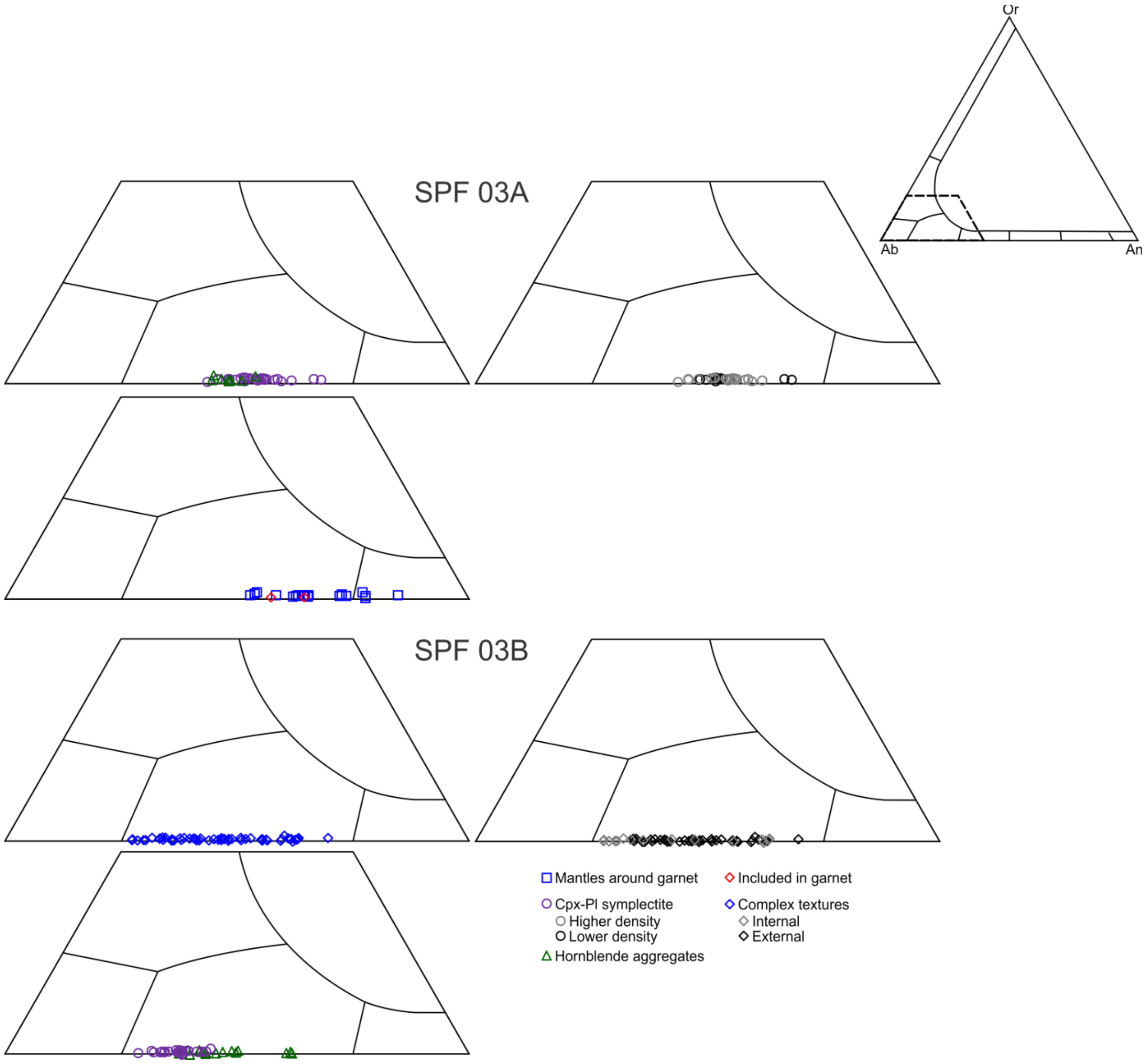

Figure 5.16. Chemical composition of plagioclase from samples SPF 03A and SPF 03B.

Following Santos *et al.* (in preparation, chapter 4-this volume) $Fe^{3+}/(Fe^{3+}+Fe^{2+})$ was set to 0.2. Both diagrams were constructed considering H_2O as an excess phase up to the solidus. After that, H_2O was adjusted so that samples would be just H_2O-saturated at the solidus, at 8 kbar. Both pseudosections were calculated in the *P*-*T* spectrum 5-25 kbar, 575-800 °C. For SPF 03A, garnet composition isopleths are also shown.

Despite some topological differences, both diagrams are, in essence, similar. At the low-*P* part of the diagrams assemblages are dominated by hornblende and diopside, plus either plagioclase or epidote, depending on pressure. As pressure increases, garnet becomes part of the assemblage, and further up-*P* diopside becomes progressively enriched in Na, with the diopside-omphacite *solvus* being visible in both diagrams. At 20-21 kbar hornblende runs out, bringing the typical eclogite assemblage dominated by omphacite and garnet. The main difference between the two diagrams is the position of the *solidus* curve, which in SPF 01A is predicted to be at temperatures up to 100 °C lower than in SPF 03A. This difference is likely related to the lower Na_2O and K_2O contents of SPF 03A. The lower K_2O content also explains the absence of mica from most of the assemblages predicted for SPF 03A.

Both pseudosections predict diopside to be stable at the lowest modelled temperatures and pressures. This feature may be related to issues with activity composition models available, as discussed by Santos *et al.* (submitted, chapter 2-this volume) and Forshaw *et al.* (in press).

Predicted Ca contents of garnet from SPF 03A do not agree with measured compositions, and, furthermore, measured contents are, in general, lower than the lowest predicted values. On the other hand, measured $Fe^{2+}/(Fe^{2+}+Mg)$ values are predicted, and would occur roughly at the pressures calculated by Santos *et al* (in preparation, chapter 4-this volume) for SPF 03A.

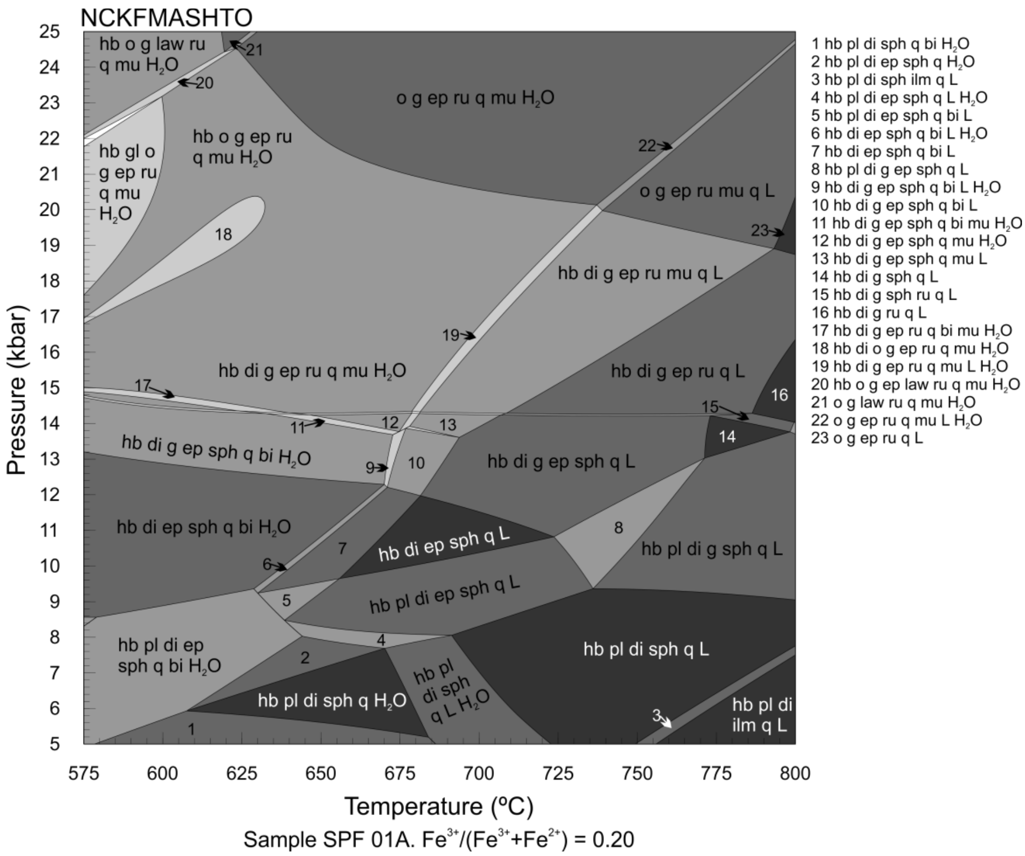

Figure 5.17. *P-T* pseudosection calculated for sample SPF 01A.

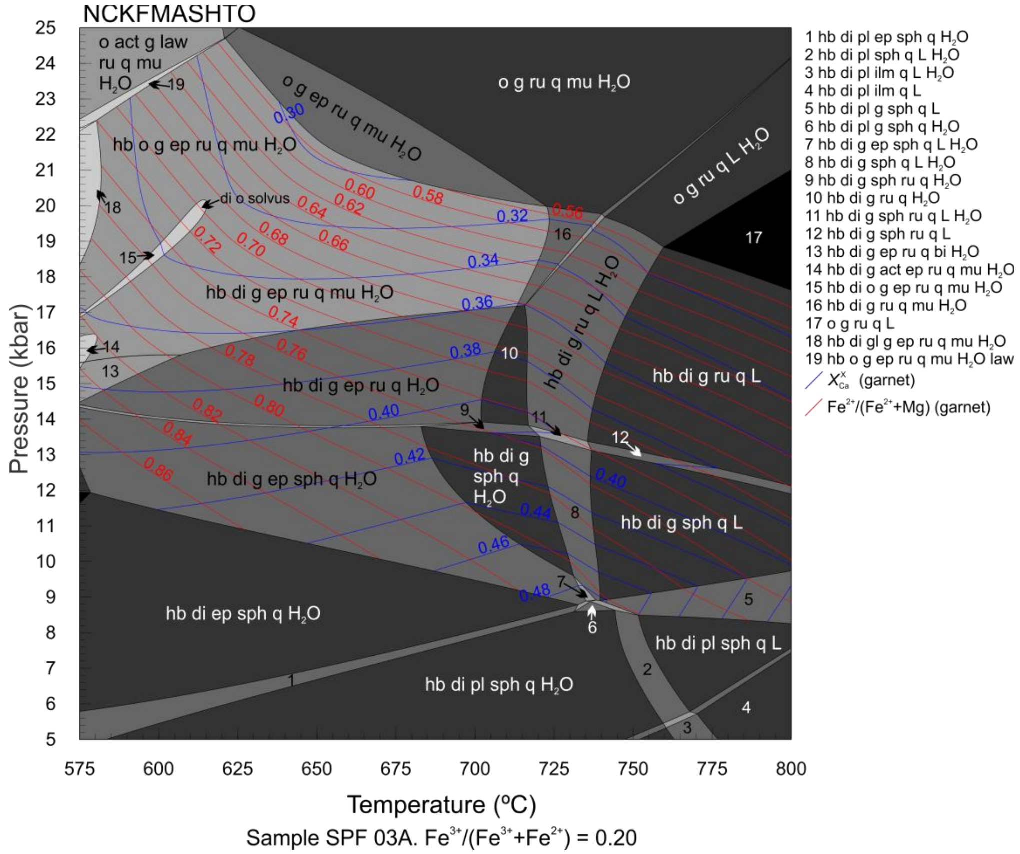

Figure 5.18. *P-T* pseudosection calculated for sample SPF 03A. Blue lines are isopleths of fraction of Ca in garnet X site. Red lines are isopleths of $Fe^{2+}/(Mg+Fe^{2+})$ ratio in garnet.

The field of the SPF 01A pseudosection that most closely approximate the observed assemblage is the hornblende + plagioclase + diopside + epidote + sphene + quartz + H_2O field (number 2 in Figure 5.17) with the caveat that observed diopside is likely metastable (the same applying to garnet). In this field, predicted hornblende compositions are similar, but nonetheless different from observed ones, with $Mg/(Fe^{2+}+Mg)$ in the same range and predicted $^{A}(Na+K)$ (0.59-0.62 apfu) at the extreme of the measured range (0.5-0.6 apfu). Predicted hornblende is also richer in Al (1.0-1.1 ^{C}Al apfu, against measured 0.8-1.0 apfu). Predicted plagioclase compositions more calcic (An_{45-50}) than measured ones (An_{20-30}).

5.7 Discussion

5.7.1 Textural evolution

The samples analyzed here represent similar rocks at different degrees of retrograde reequilibration. These differences are clear in the textural differences between the samples. Sample SPF 03A has a clearly domainal texture, with garnet crystals and its coronas clearly distinct from the symplectite domains, which, in turn, are clearly different from the hornblende aggregates. SPF 01C are similar to SPF 03A, but already show differences that indicate evolution towards homogenization: the appearance of discrete hornblende crystals in the symplectite domains, and a degree of "blurring" of the plagioclase-hornblende coronas, *i.e.* irregularities, "missing" sections and plagioclase from coronas linking with the symplectite domain. This trend is further advanced in SPF 01A, where coronas around garnet are more diffuse and hornblende is widespread, as are discrete plagioclase crystals. More importantly, SPF 01A does not present the domainal texture observed in SPF 03A, what is an indication of the equilibration volume approaching the scale of a thin section.

5.7.2 Compositional evolution

In addition to the domainal texture discussed above, the most distinct textural feature of SPF 03A is the presence of clinopyroxene-plagioclase symplectites, which represent the break-up of sodic clinopyroxene. Santos *et al.* (in preparation, chapter 4-this volume) reconstructed clinopyroxene composition (from a compositional map) and used the Al content of 0.3 apfu as a proxy for the omphacite content (see also Tedeschi *et al.*, 2017). Using this omphacite content and the mean of measured Fe^{2+} and Mg contents, a simple way to represent this break-up would be by the following reaction:

$$9Na_{0.3}Ca_{0.7}Al_{0.3}(Fe^{2+},Mg)_{0.7}Si_2O_6 + 0.33Ca + 0.65Si \rightarrow$$

$$7Na_{0.1}Ca_{0.9}Al_{0.1}(Fe^{2+},Mg)_{0.9}Si_2O_6 + 1.66Na_{0.8}Ca_{0.2}Al_{1.2}Si_{2.8}O_8 + 0.67Na \quad (1)$$

in which Fe^{2+}, Mg and Al are taken to remain constant, and plagioclase composition is also the mean of measured symplectite composition. This reaction predicts addition of Ca and Si to the symplectite domain, and excess Na. Features such as the Na-rich plagioclase coronas around garnet and the presence of plagioclase films around inclusions in garnet represent this Na excess (and attest to its mobility). The addition of Si and Ca requires sources for them. Quartz is an obvious source for Si. Regarding Ca, garnet should have been one of the main phases of the rock in the high-pressure stage, and measured Ca contents in garnet are lower than the predicted contents for the high-*P* stage, so it fits as the Ca source for the symplectites.

Hornblende is present in SPF 03A in basically four different textural contexts: as "patches" in clinopyroxene symplectites, in coronas, in aggregates and included in garnet. Although their compositions overlap, distinction can be made, at least, between compositions of the "patches", the inclusions and of the other two types.

Texture suggests that hornblende patches substitutes for clinopyroxene. Their relatively limited occurrence supports the conclusion of Schorn & Diener (2017), that little H_2O is enough to trigger reactions in rocks, because else this substitution should be extensive. Hornblende compositions, with relatively low Al and Mg/(Mg+Fe^{2+}) ratios similar to that of clinopyroxene, agree with the textural evidence for a direct substitution, with little participation of components from out of the domain. Corona hornblende forms by reaction between garnet and the decomposing clinopyroxene. The zoning verified in hornblende from coronas reflects low mobility of Al, with progressively lower Al contents with distance from garnet (*i.e.*, the Al source); Mg/(Mg+Fe^{2+}) ratio also varies, being lower with lower Al, what can be either related to diffusion of Fe^{2+} and Mg themselves or be linked with Al content. Schumacher *et al.* (2007) cites a tendency of amphiboles with higher Al contents to have lower Mg/(Mg+Fe^{2+}), pointing to the latter explanation, which is also in agreement with evidence from elsewhere (Santos *et al.*, submitted-chapter 3-this volume).

The origin of hornblende aggregates is less straightforward: if they are a wholly retrograde feature, they should represent clinopyroxene substitution, what raises the question of why would this process be so complete in some domains and so incipient in others. An alternative explanation stems from thermodynamic modelling: at the *P-T* conditions suggested by Santos *et al.* (in preparation-chapter 4-this volume) hornblende would be stable, and its predicted composition would not be very different from measured compositions, being more Al-rich (≈ 1.1 ^{C}Al apfu) and slightly richer in Na (0.15-0.17 ^{B}Na apfu). The hornblende aggregates now present may represent this former hornblende, as its formation (contrary to its formation from clinopyroxene) would require diffusion of several elements (Si, Al, Na, Fe^{2+}, Mg), but in small quantities. Furthermore, plagioclase films between these hornblende crystals may represent the product of the expelled Na and Al. Finally, hornblende inclusions in garnet are at the extreme of the trend defined by the other types, with highest values of Al, ^{A}(Na+K) and the lowest Mg/(Mg+Fe^{2+}). In accordance with the suggestion above, these compositions may represent prograde hornblende trapped inside garnet. This explanation is supported by the fact that some inclusions display somewhat higher ^{B}Na values.

The textural evolution leading to rocks such as samples SPF 01C and SPF 01A is accompanied by mineral composition changes, especially in hornblende, but, to a lesser degree, also in clinopyroxene and plagioclase. Hornblende compositions become more homogeneous in SPF 01C and, and become practically indistinguishable in SPF 01A. Compositional differences between different plagioclase types diminish (although the compositional span does not change much) and, in clinopyroxene, maximum Na contents are lowered (Figure 5.11). These features, like textural features, point to a more efficient diffusion, and flattening of chemical potential gradients. However, compositions of hornblende, and, especially, plagioclase, do not agree with predicted compositions (see above): predicted hornblende is to pargasitic, and predicted plagioclase is too anorthitic. One possible explanation for that can be that in SPF 01 garnet is persisting metastable, and "holding" the Al necessary for these compositional changes to occur. However, modelling may be at fault in the predicted stabilities and compositions of clinopyroxene and garnet (see Forshaw *et al.*, in press; also Santos *et al.*, submitted-chapter 2-this volume).

5.7.3 Complex textures

Sample SPF 03B stands out, because of the seemingly complex textural patterns it presents. The fact that this sample was collected just meters away from SPF 03A, along with basic textural features, suggests that it experienced an evolution similar to that of SPF 03A, in terms of *P-T* conditions, deformation and fluid access. Moreover, their chemical composition is fairly similar, so their textural differences must stem from some other factor. The most likely one is textural differences that predate their last metamorphic event.

Garnet coronas around igneous pyroxene is a common prograde feature in metamafic rocks (*e.g.* Rubie, 1990; Carlson & Johnson, 1991; White & Clark, 1997), while garnet coronas around hornblende are seldom reported. The formation of eclogite from amphibolite does involve consumption of hornblende, as shown by the model reactions presented by Bucher & Grapes (2011) and by phase equilibria calculations (with THERMOCALC) performed using the compositions of samples SPF0 03A, 01A and 03B, but such an evolution would occur in H_2O saturated conditions, thus making the formation of coronas less probable. It seems more likely that the garnet coronas described here formed around pyroxene, which was later converted to hornblende. In one case where garnet coronas around hornblende were described, Barink (1984) arrived at the same conclusion about their origin.

The coronas around quartz are also rarely described in metamafic rocks, and difficult to interpret. As with hornblende, quartz is predicted to decrease in the transition from amphibolite to eclogite, but by dehydration reactions, in H_2O-saturated conditions. If coronas around quartz represent textural features inherited from previous stages, one possibility might be that they represent igneous features (like those described by Mashima, 2004)

In both textural features interpreted above, the minerals discussed are almost always separated by films of plagioclase. This is likely associated to Na-clinopyroxene decomposition: Since Ca, Al and Si are available in the other major phases (garnet and hornblende), fast diffusion of Na is the only requirement for formation of plagioclase at every contact, not only near decomposing clinopyroxene. In fact, plagioclase was formed not only between the different phases in the reaction textures from SPF 03B, but even between garnet and hornblende, quartz and rutile inclusions, in all samples. Other cases of reaction textures that include components from distal form texture are described by White *et. al.* (2008), Štípská *et al.* (2010), Baldwin *et al.* (2015) and Santos *et al.* (submitted, chapter 3-this volume).

5.8 Conclusions

The retroeclogites from São Sebastião do Paraíso record different stages in the evolution of a mafic rock suite submitted to eclogite-facies conditions and variably reequilibrated at lower temperature and pressure. Despite the evolution in texture, even the most reequilibrated samples studied here are still recognizable as related to their less evolved counterparts, and it is likely that prograde features are still visible.

Although some textures seem complex, basic mobility relations between different cations can explain them well. In this case, the most important cations are Na and Al. The high mobility of Na explains the presence of plagioclase in all the observed reaction textures, while the low mobility of Al explains the observed zoning patterns.

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6 FINAL CONSIDERATIONS

6.1 Conclusions

6.1.1 The metamorphism of mafic rocks

As exemplified on this contribution, the metamorphism of mafic rocks remains a complex subject, despite being intensely studied in the last decades (*e.g.* Laird, 1980; Apted & Liou, 1983; Palin *et al.*, 2016). In fluid-unsaturated conditions, as is likely to occur in non-progressive metamorphism and retrometamorphism, actual H_2O quantity and differences in mobility between distinct elements exert a substantial influence on the resulting textures and mineralogy. For instance, in the examples studied here, the presence of garnet in the metagabbro from the Mantiqueira Complex (Chapter 3) is linked to low contents of H_2O, and in this example, as much as in the retroeclogites from São Sebastião do Paraíso (Chapter 5), textures are conditioned by the relative mobilities of the elements. It is noteworthy that in both cases the *slow* diffusion of Al plays a determinant role in textural evolution, while, on the other hand, Na, whose diffusion is *fast*, is also determinant in the textures found in the retroeclogites from São Sebastião do Paraíso.

In both examples studied here, as rocks become more hydrated, observed assemblages converge to predicted equilibrium ones, but this is not a simple and regular process, as exemplified by the different types of chemical zoning in amphiboles from Mantiqueira Complex amphibolites (Chapter 3). Moreover, even in the most hydrated samples analyzed in this study chemical equilibrium was not attained. The picture of the metamorphism of mafic rocks that emerges from the examples studied here is one of an irregular process, where local equilibrium features (like zoning patterns in amphibolites from the Mantiqueira Complex) persist even after full hydration and textural features inherited from previous stages (like the reaction textures in the retroeclogites from São Sebastião do Paraíso) exert influence over spatial organization even after hydration and deformation.

6.1.2 On the methods for modelling and measuring the metamorphism of mafic rocks

As shown here, even in idealized, hand-sample equilibrium situations, determining metamorphic conditions from metamafic rocks may not be a straightforward task. On Chapter 2, it was specifically shown that problems in the most recent set of activity-composition models available for mafic rocks (Green *et al.*, 2016; White *et al.*, 2014a, and references therein) lead to inadequate behavior of clinopyroxene, garnet and hornblende. Such behavior effectively renders this set of models inadequate for SiO_2-unsaturated, greenschist- to amphibolite-facies rocks, and, in all likelihood, also affects modelling of mafic rocks outside this *P-T* spectrum. Nonetheless, thermodynamic modelling is, when used cautiously, a powerful tool, as can be seen in many examples on a wide spectrum of rocks (*e.g.* Štípská *et al.*, 2010; Palin & White, 2016; White *et al.*, 2017; Tang *et al.*, 2017). Moreover, an even more powerful approach may be obtained by the combination of thermodynamic modelling with advanced analytical techniques and other thermobarometric tools, as exemplified in Chapter 4. Through a combination of quantitative compositional mapping, thermodynamic modelling and trace-element thermobarometry, it was possible to constrain the *P-T* path of retroeclogites from São Sebastião do Paraíso, rocks that display a highly domainal texture.

6.1.3 Future research

The study of metamafic rocks will remain an open field in the foreseeable future, and results from this thesis may provide some possible inquiry topics. One of the most important lines of research is surely the development of more accurate activity-composition models for mineral phases of interest, in particular clinopyroxene, amphibole and garnet. Despite the fact that many of the processes described in this work (regarding, for example, clinopyroxene substitution and garnet formation in metagabbro, Chapter 3) seem to be general features, investigation of other, similar occurrences will be necessary to validate the interpretations of this contribution.

Another important field, which should receive special attention in the future, is the combination of thermodynamic modelling with quantitative compositional mapping, as stressed elsewhere (Lanari & Engi, 2017; Lanari & Duesterhoeft, in press). In fact, the application of these techniques can be a fruitful step towards obtaining a more detailed picture of the evolution of the retroeclogites from São Sebastião do Paraíso.

6.2 References

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APPENDIX A: ELECTRON MICROPROBE ANALYSIS OF MINERALS FROM METAMAFIC ROCKS FROM THE MANTIQUEIRA COMPLEX (CHAPTER 3)

For all minerals Fe was analyzed as FeO (total). Fe^{3+} proportions were calculated stoichiometrically for clinopyroxene, garnet, ilmenite/magnetite and amphibole. In the first three cases it was done using the method proposed by Droop (1987), while for amphibole the Schumacher method (described in Leake *et al.*, 1997) was used.

Mineral							Clinopyroxene						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Cpx 1 c2	Cpx 1 b1	Cpx 1 b2	Cpx 2.1c1	Cpx 2.2 b1	Cpx 2.2 c1	Cpx 2.1 b1	Cpx 2.3 c1	Cpx 2.4 c1	Cpx 3.1 c1	Cpx 3.1 c2	Cpx 3.2 c1	Cpx 3.3 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	51.33	50.84	51.22	51.35	51.64	50.85	51.73	51.41	51.46	51.37	50.72	51.71	51.27
TiO_2	0.26	0.28	0.28	0.30	0.24	0.22	0.12	0.19	0.18	0.19	0.23	0.18	0.18
Al_2O_3	1.88	2.84	2.02	2.09	1.76	2.97	1.77	2.17	1.62	1.81	2.94	1.72	1.90
FeO (total)	9.76	11.21	10.73	9.45	8.87	9.81	8.62	9.25	8.75	9.47	10.11	9.84	9.74
MnO	0.24	0.25	0.22	0.29	0.27	0.29	0.28	0.29	0.33	0.31	0.30	0.31	0.33
MgO	13.31	12.95	12.87	13.31	13.43	13.23	13.36	13.43	13.14	12.99	12.98	13.13	12.69
CaO	22.00	19.96	20.80	21.52	22.05	20.59	22.18	21.09	22.53	21.61	19.93	21.95	21.86
Na_2O	0.36	0.44	0.40	0.36	0.42	0.47	0.42	0.47	0.36	0.39	0.49	0.32	0.38
K_2O	0.05	0.15	0.08	0.10	0.02	0.07	0.05	0.08	0.03	0.07	0.05	0.08	0.03
Cr_2O_3	0.47	0.09	0.27	0.14	0.23	0.28	0.36	0.60	0.36	0.32	0.50	0.10	0.45
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.66	99.01	98.88	98.90	98.93	98.77	98.89	98.98	98.76	98.54	98.26	99.35	98.83
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.93	1.92	1.94	1.94	1.94	1.92	1.95	1.94	1.94	1.95	1.93	1.95	1.94
Ti	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Al	0.08	0.13	0.09	0.09	0.08	0.13	0.08	0.10	0.07	0.08	0.13	0.08	0.08
Fe^{2+}	0.23	0.29	0.30	0.25	0.23	0.25	0.22	0.24	0.22	0.26	0.29	0.26	0.26
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	0.74	0.73	0.73	0.75	0.75	0.74	0.75	0.75	0.74	0.73	0.74	0.74	0.72
Ca	0.88	0.81	0.84	0.87	0.89	0.83	0.90	0.85	0.91	0.88	0.81	0.89	0.89
Na	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.02	0.03
K	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.00	0.01
Fe^{3+}	0.08	0.06	0.04	0.05	0.05	0.06	0.05	0.05	0.06	0.04	0.03	0.05	0.04
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	05 III 20	05 III 20	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Cpx 3.3 b1	Cpx 3.4 c1	Cpx1 c1	Cpx1 c2	Cpx1 c3	Cpx1 b1	Cpx1 b2	Cpx2 b1	Cpx2 b2	Cpx2 c1	Cpx3 b1	Cpx3 c1	Cpx3 b2
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	52.90	51.61	52.38	51.56	49.49	49.71	50.27	52.05	51.92	50.80	50.28	50.12	51.14
TiO_2	*n.d.*	0.13	0.59	0.65	0.50	0.38	1.16	0.04	0.07	0.12	0.34	0.25	0.21
Al_2O_3	0.61	1.75	1.76	1.86	4.31	3.49	1.70	0.61	0.82	2.28	3.47	3.21	2.06
FeO (total)	9.10	9.89	8.63	9.80	13.26	14.05	12.98	11.73	11.50	13.00	12.35	12.49	12.31
MnO	0.32	0.29	0.23	0.29	0.31	0.31	0.36	0.35	0.36	0.34	0.34	0.32	0.35
MgO	13.12	12.98	17.89	16.76	11.61	11.35	11.51	11.81	11.91	11.67	12.14	12.15	11.84
CaO	22.91	21.66	17.75	17.74	18.51	18.64	20.52	22.47	22.60	19.84	18.56	18.54	20.78
Na_2O	0.34	0.44	0.17	0.18	0.71	0.63	0.42	0.32	0.39	0.49	0.61	0.55	0.45
K_2O	*n.d.*	0.06	*n.d.*	*n.d.*	0.09	0.16	0.10	0.01	*n.d.*	0.10	0.08	0.17	0.06
Cr_2O_3	0.15	0.39	0.18	0.16	0.15	0.11	0.15	0.02	0.06	0.07	0.07	0.05	0.03
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.45	99.19	99.58	98.99	98.94	98.82	99.16	99.41	99.63	98.72	98.23	97.86	99.23
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.99	1.95	1.93	1.92	1.88	1.90	1.92	1.98	1.97	1.94	1.92	1.93	1.94
Ti	0.00	0.00	0.02	0.02	0.01	0.01	0.03	0.00	0.00	0.00	0.01	0.01	0.01
Al	0.03	0.08	0.08	0.08	0.19	0.16	0.08	0.03	0.04	0.10	0.16	0.15	0.09
Fe^{2+}	0.26	0.26	0.22	0.26	0.35	0.37	0.37	0.33	0.30	0.37	0.36	0.35	0.34
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	0.74	0.73	0.98	0.93	0.66	0.65	0.66	0.67	0.67	0.67	0.69	0.70	0.67
Ca	0.92	0.88	0.70	0.71	0.76	0.76	0.84	0.92	0.92	0.81	0.76	0.76	0.85
Na	0.03	0.03	0.01	0.01	0.05	0.05	0.03	0.02	0.03	0.04	0.04	0.04	0.03
K	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Cr	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.03	0.06	0.04	0.05	0.07	0.08	0.05	0.05	0.06	0.05	0.03	0.05	0.05
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Cpx4 b1	Cpx4 c1	Cpx4 c2	Cpx4 c3	Cpx4 b2	Cpx 1 c1	Cpx 1 c2	Cpx 1 c3	Cpx 1 c4	Cpx 2.1 c1	Cpx 2.1 c2	Cpx 2.1 b1	Cpx 2.1 c3
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	51.25	51.60	51.82	48.93	46.37	51.58	52.12	52.34	52.28	52.23	47.50	47.10	49.56
TiO_2	0.11	0.22	0.15	0.49	0.81	0.17	0.15	*n.d.*	0.06	0.15	2.97	0.65	0.42
Al_2O_3	1.14	0.98	1.00	4.47	7.66	1.53	1.40	0.59	0.58	1.36	3.28	7.64	4.14
FeO (total)	12.18	11.81	11.43	15.07	17.76	9.90	10.01	10.02	10.00	9.24	13.94	16.15	11.94
MnO	0.40	0.44	0.47	0.34	0.28	0.35	0.35	0.37	0.34	0.30	0.33	0.24	0.31
MgO	11.46	11.60	11.85	11.28	10.63	12.27	12.49	12.56	12.77	13.62	11.81	11.76	12.07
CaO	21.98	21.89	21.97	16.29	11.31	22.32	22.49	22.76	23.04	21.52	17.84	11.56	19.13
Na_2O	0.39	0.40	0.48	0.75	1.12	0.42	0.44	0.31	0.30	0.37	0.50	1.00	0.69
K_2O	0.01	*n.d.*	*n.d.*	0.26	0.53	*n.d.*	0.03	*n.d.*	*n.d.*	0.01	0.14	0.57	0.04
Cr_2O_3	0.12	0.19	0.19	0.33	0.37	0.17	0.15	0.02	*n.d.*	0.11	0.15	0.04	0.14
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.04	99.14	99.37	98.22	96.83	98.71	99.62	98.97	99.38	98.91	98.47	96.71	98.44
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.96	1.97	1.97	1.89	1.82	1.96	1.96	1.99	1.97	1.97	1.84	1.83	1.89
Ti	0.00	0.01	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.09	0.02	0.01
Al	0.05	0.04	0.04	0.20	0.35	0.07	0.06	0.03	0.03	0.06	0.15	0.35	0.19
Fe^{2+}	0.33	0.34	0.31	0.42	0.51	0.28	0.27	0.28	0.26	0.26	0.39	0.46	0.31
Mn	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	0.65	0.66	0.67	0.65	0.62	0.70	0.70	0.71	0.72	0.77	0.68	0.68	0.69
Ca	0.90	0.89	0.89	0.67	0.47	0.91	0.91	0.92	0.93	0.87	0.74	0.48	0.78
Na	0.03	0.03	0.04	0.06	0.08	0.03	0.03	0.02	0.02	0.03	0.04	0.08	0.05
K	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.00
Cr	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.06	0.04	0.05	0.06	0.08	0.04	0.04	0.03	0.06	0.03	0.06	0.06	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Cpx 2.1 b2	Cpx 2.1 b3	Cpx 2.2 c1	Cpx 2.3 c1	Cpx 3 c1	Cpx 3 c2	Cpx 3 b1	Cpx 3 c3	Cpx 3 b2	Cpx1 c1	Cpx1 c2	Cpx1 c3	Cpx1 c4
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	50.46	50.65	52.30	52.49	51.00	50.58	50.47	51.09	50.48	50.80	51.80	51.26	51.06
TiO_2	0.31	0.30	0.07	0.06	0.35	0.23	0.25	0.32	0.21	0.54	0.16	0.23	0.26
Al_2O_3	2.81	2.24	0.55	0.50	1.95	3.09	2.92	2.40	2.99	1.88	1.86	2.21	3.67
FeO (total)	12.00	11.48	10.37	10.37	9.26	11.88	12.51	10.62	12.07	17.43	10.49	10.54	11.27
MnO	0.31	0.32	0.34	0.38	0.32	0.26	0.27	0.28	0.31	0.47	0.25	0.22	0.22
MgO	12.05	12.34	12.60	12.57	12.80	12.92	12.07	13.01	12.16	14.61	12.93	13.05	14.42
CaO	19.95	20.30	22.80	22.60	22.35	18.60	19.30	20.46	19.42	13.66	21.49	21.09	16.70
Na_2O	0.50	0.43	0.30	0.35	0.45	0.56	0.50	0.50	0.52	0.29	0.45	0.47	0.58
K_2O	0.15	0.08	0.01	*n.d.*	0.02	0.14	0.18	0.07	0.16	*n.d.*	0.04	0.08	0.05
Cr_2O_3	0.06	0.16	0.04	*n.d.*	0.25	0.20	0.09	0.21	0.05	0.08	0.02	0.16	0.24
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.61	98.31	99.38	99.32	98.74	98.45	98.56	98.96	98.36	99.75	99.48	99.30	98.47
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.92	1.94	1.98	1.99	1.93	1.92	1.93	1.93	1.93	1.93	1.95	1.93	1.93
Ti	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.01	0.01
Al	0.13	0.10	0.02	0.02	0.09	0.14	0.13	0.11	0.13	0.08	0.08	0.10	0.16
Fe^{2+}	0.33	0.32	0.28	0.29	0.22	0.33	0.35	0.28	0.34	0.50	0.28	0.26	0.34
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Mg	0.69	0.70	0.71	0.71	0.72	0.73	0.69	0.73	0.69	0.83	0.73	0.73	0.81
Ca	0.82	0.83	0.92	0.92	0.91	0.76	0.79	0.83	0.79	0.56	0.87	0.85	0.68
Na	0.04	0.03	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.02	0.03	0.03	0.04
K	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01
Fe^{3+}	0.06	0.05	0.05	0.04	0.07	0.05	0.05	0.06	0.05	0.06	0.05	0.07	0.01
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Cpx1 c5	Cpx1 c6	Cpx2 b1	Cpx2 b2	Cpx2 c1	Cpx2 c2	Cpx2 c3	Cpx2 c4	Cpx3 1	Cpx3 2	Cpx3 3	Cpx3 4	Cpx4 1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	49.99	50.65	48.91	51.93	50.12	49.06	50.75	50.89	52.40	52.04	51.32	50.62	51.49
TiO_2	0.63	0.58	0.60	0.16	0.39	0.56	1.06	0.27	0.09	0.13	0.29	0.24	0.18
Al_2O_3	4.97	4.15	4.84	1.09	3.46	4.73	2.10	2.51	1.15	1.25	2.43	2.97	1.95
FeO (total)	10.05	11.09	13.12	10.99	13.18	14.10	24.36	22.72	9.80	9.52	10.31	11.21	11.28
MnO	0.22	0.17	0.15	0.17	0.16	0.15	0.29	0.32	0.32	0.31	0.28	0.26	0.24
MgO	13.73	14.32	11.85	12.50	12.28	11.91	14.46	14.47	13.31	13.01	12.99	12.62	12.59
CaO	18.17	16.21	17.79	22.50	18.63	16.70	3.94	5.01	21.95	22.50	21.40	20.00	20.91
Na_2O	0.82	0.67	0.82	0.44	0.63	0.77	0.32	0.36	0.36	0.47	0.48	0.55	0.48
K_2O	0.01	0.09	*n.d.*	0.01	0.07	0.14	0.10	0.12	0.02	0.01	0.05	0.03	0.08
Cr_2O_3	0.10	0.20	0.13	0.18	0.17	0.25	*n.d.*	0.06	0.06	0.18	0.14	0.38	0.10
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.69	98.13	98.21	99.97	99.08	98.36	97.39	96.73	99.47	99.43	99.69	98.88	99.30
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.88	1.92	1.87	1.95	1.90	1.88	1.98	1.99	1.97	1.96	1.92	1.92	1.95
Ti	0.02	0.02	0.02	0.00	0.01	0.02	0.03	0.01	0.00	0.00	0.01	0.01	0.01
Al	0.22	0.19	0.22	0.05	0.15	0.21	0.10	0.12	0.05	0.06	0.11	0.13	0.09
Fe^{2+}	0.26	0.35	0.35	0.27	0.35	0.39	0.80	0.74	0.27	0.24	0.25	0.30	0.30
Mn	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	0.77	0.81	0.68	0.70	0.70	0.68	0.84	0.84	0.75	0.73	0.73	0.71	0.71
Ca	0.73	0.66	0.73	0.91	0.76	0.69	0.17	0.21	0.88	0.91	0.86	0.81	0.85
Na	0.06	0.05	0.06	0.03	0.05	0.06	0.02	0.03	0.03	0.03	0.04	0.04	0.04
K	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.00
Fe^{3+}	0.06	0.00	0.07	0.08	0.07	0.06	0.00	0.00	0.04	0.06	0.07	0.06	0.06
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	3.95	3.96	4.00	4.00	4.00	4.00	4.00

Mineral		Clinopyroxene						Amphibole					
Sample	PNF 01A	PNF 01A	PNF 01A	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Cpx4 2	Cpx4 3	Cpx4 4	Hbl1 1	Hbl1 2	Hbl1 3	Hbl2 1	Hbl2 2	Hbl2 3	Hbl2 4	Hbl2 5	Hbl2 6	Hbl3.1 b1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	51.31	51.04	49.50	41.65	44.04	43.91	40.33	42.61	41.63	41.60	51.67	41.92	42.39
TiO_2	0.17	0.35	2.59	0.99	0.98	1.12	1.29	1.29	1.56	1.23	0.37	0.99	1.20
Al_2O_3	2.24	2.60	1.00	14.10	11.06	11.31	14.35	12.56	13.79	13.38	4.06	13.96	12.96
FeO (total)	11.70	11.76	13.21	17.82	17.18	16.89	17.59	17.03	17.74	17.76	14.53	18.10	18.34
MnO	0.20	0.25	0.25	0.15	0.14	0.16	0.13	0.13	0.13	0.14	0.15	0.14	0.20
MgO	12.60	12.26	12.24	8.62	10.15	10.14	8.16	9.16	8.38	8.66	14.32	8.65	8.86
CaO	20.39	20.35	20.81	11.34	11.52	11.42	11.46	11.43	11.18	11.24	11.54	11.54	11.53
Na_2O	0.49	0.53	0.36	1.50	1.25	1.33	1.62	1.46	1.54	1.51	0.51	1.47	1.36
K_2O	0.08	0.10	*n.d.*	1.31	0.96	0.95	1.45	1.11	1.29	1.24	0.22	1.23	1.30
Cr_2O_3	0.11	0.20	*n.d.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.d.*	0.01	0.03	0.01	0.02	0.03	0.03	*n.d.*	0.04	0.04
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.30	99.44	99.96	97.48	97.29	97.26	96.39	96.79	97.27	96.79	97.37	98.04	98.18
Oxygens	6.00	6.00	6.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	1.94	1.93	1.88	6.27	6.58	6.56	6.18	6.44	6.28	6.31	7.51	6.28	6.35
Ti	0.00	0.01	0.07	0.11	0.11	0.13	0.15	0.15	0.18	0.14	0.04	0.11	0.14
Al	0.10	0.12	0.04	2.50	1.95	1.99	2.59	2.24	2.45	2.39	0.70	2.46	2.29
Fe^{2+}	0.31	0.32	0.34	2.00	1.87	1.86	2.11	2.00	2.05	2.02	1.59	2.01	2.03
Mn	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03
Mg	0.71	0.69	0.69	1.93	2.26	2.26	1.86	2.06	1.89	1.96	3.10	1.93	1.98
Ca	0.83	0.82	0.85	1.83	1.85	1.83	1.88	1.85	1.81	1.83	1.80	1.85	1.85
Na	0.04	0.04	0.03	0.44	0.36	0.39	0.48	0.43	0.45	0.44	0.14	0.43	0.39
K	0.00	0.00	0.00	0.25	0.18	0.18	0.28	0.21	0.25	0.24	0.04	0.23	0.25
Cr	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.06	0.05	0.08	0.24	0.28	0.25	0.14	0.16	0.19	0.23	0.18	0.26	0.27
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	15.59	15.46	15.47	15.69	15.54	15.57	15.58	15.11	15.58	15.56

Mineral							Amphibole						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Hbl3.1 b2	Hbl3.2 b1	Hbl3.2 c1	Hbl3.2 c2	Hbl3.3 b1	Hbl3.3 c1	Hbl3.3 b2	Hbl4.1 1	Hbl4.1 2	Hbl4.1 3	Hbl4.1 4	Hbl4.1 5	Hbl4.2 1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	42.22	42.60	50.75	52.78	43.62	51.21	45.76	45.40	41.81	40.72	47.25	42.71	41.84
TiO_2	0.71	0.82	0.41	0.26	0.77	0.27	0.59	0.98	1.30	0.94	0.41	0.63	1.32
Al_2O_3	13.61	12.98	5.53	3.00	12.65	5.36	10.38	9.39	12.63	14.47	8.66	13.05	12.92
FeO (total)	18.19	17.16	14.65	13.75	16.87	14.10	15.76	16.77	17.98	18.30	16.58	17.85	18.35
MnO	0.17	0.18	0.22	0.23	0.21	0.25	0.20	0.15	0.16	0.17	0.16	0.18	0.14
MgO	8.60	9.50	13.63	15.12	9.72	14.01	11.13	11.12	8.99	8.06	11.38	9.29	8.80
CaO	11.44	11.45	11.47	11.44	11.63	11.53	11.51	11.49	11.40	11.36	11.58	11.49	11.41
Na_2O	1.36	1.39	0.66	0.32	1.33	0.62	1.11	1.20	1.44	1.47	0.98	1.33	1.44
K_2O	1.33	1.15	0.33	0.14	1.15	0.26	0.82	0.69	1.36	1.56	0.64	1.20	1.34
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.03	0.01	0.03	0.01	0.02	0.01	0.02	*n.d.*	0.04	0.04	0.02	0.02	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.66	97.25	97.67	97.06	97.97	97.63	97.28	97.19	97.11	97.09	97.65	97.74	97.58
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.31	6.39	7.36	7.66	6.48	7.41	6.77	6.75	6.33	6.16	6.92	6.38	6.31
Ti	0.08	0.09	0.04	0.03	0.09	0.03	0.07	0.11	0.15	0.11	0.04	0.07	0.15
Al	2.40	2.29	0.95	0.51	2.22	0.91	1.81	1.65	2.25	2.58	1.50	2.30	2.30
Fe^{2+}	1.76	1.86	1.57	1.58	1.89	1.51	1.71	1.76	2.02	1.83	1.49	1.88	2.05
Mn	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02
Mg	1.92	2.12	2.95	3.27	2.15	3.02	2.45	2.47	2.03	1.82	2.49	2.07	1.98
Ca	1.83	1.84	1.78	1.78	1.85	1.79	1.82	1.83	1.85	1.84	1.82	1.84	1.84
Na	0.39	0.40	0.19	0.09	0.38	0.17	0.32	0.35	0.42	0.43	0.28	0.38	0.42
K	0.25	0.22	0.06	0.03	0.22	0.05	0.15	0.13	0.26	0.30	0.12	0.23	0.26
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.51	0.29	0.21	0.09	0.21	0.19	0.24	0.33	0.26	0.48	0.54	0.36	0.27
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.48	15.54	15.14	15.07	15.52	15.12	15.38	15.39	15.61	15.57	15.21	15.53	15.60

Mineral							Amphibole						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Hbl4.2 2	Hbl5 1	Hbl5 2	Hbl5 3	Hbl5 4	Hbl5 5	Hbl5 6	Hbl5 7	Hbl5 8	Hbl5 9	Hbl6 b1	Hbl6 b2	Hbl6 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	42.41	43.13	47.53	52.33	52.60	45.71	42.38	50.85	41.22	44.16	44.87	47.37	50.32
TiO_2	0.69	0.96	0.88	0.38	0.32	1.05	1.30	0.34	1.15	0.69	0.79	0.61	0.37
Al_2O_3	13.39	12.76	8.50	3.87	3.57	9.90	13.47	5.03	14.73	11.51	11.24	8.76	5.38
FeO (total)	17.89	16.03	14.44	12.98	12.81	15.51	16.74	14.10	17.20	15.91	16.74	15.86	14.66
MnO	0.12	0.23	0.24	0.22	0.23	0.22	0.23	0.23	0.21	0.22	0.21	0.21	0.20
MgO	9.01	10.12	12.61	15.19	15.54	11.38	9.72	14.47	8.90	10.78	10.49	12.00	13.89
CaO	11.45	11.67	11.88	11.76	12.02	11.59	11.55	11.76	11.41	11.82	11.44	11.50	11.54
Na_2O	1.39	1.32	1.00	0.49	0.42	1.19	1.42	0.58	1.57	1.21	1.19	0.98	0.63
K_2O	1.18	1.12	0.59	0.20	0.18	0.85	1.25	0.29	1.42	0.98	0.88	0.59	0.26
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.02	0.01	0.01	0.03	0.04	*n.d.*	0.02	*n.d.*	0.02	0.03	*n.d.*	0.02	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.56	97.34	97.68	97.46	97.72	97.40	98.08	97.65	97.83	97.31	97.84	97.90	97.24
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.36	6.43	6.95	7.55	7.56	6.76	6.30	7.35	6.18	6.56	6.59	6.88	7.33
Ti	0.08	0.11	0.10	0.04	0.03	0.12	0.15	0.04	0.13	0.08	0.09	0.07	0.04
Al	2.37	2.24	1.47	0.66	0.60	1.73	2.36	0.86	2.60	2.02	1.95	1.50	0.92
Fe^{2+}	1.94	1.77	1.58	1.41	1.36	1.72	1.81	1.39	1.91	1.68	1.46	1.29	1.49
Mn	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02
Mg	2.01	2.25	2.75	3.27	3.33	2.51	2.15	3.12	1.99	2.39	2.30	2.60	3.01
Ca	1.84	1.86	1.86	1.82	1.85	1.84	1.84	1.82	1.83	1.88	1.80	1.79	1.80
Na	0.40	0.38	0.28	0.14	0.12	0.34	0.41	0.16	0.46	0.35	0.34	0.28	0.18
K	0.23	0.21	0.11	0.04	0.03	0.16	0.24	0.05	0.27	0.19	0.17	0.11	0.05
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.31	0.23	0.19	0.15	0.18	0.20	0.27	0.31	0.25	0.29	0.60	0.64	0.30
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.54	15.52	15.32	15.10	15.09	15.40	15.56	15.13	15.64	15.47	15.30	15.18	15.14

Mineral							Amphibole						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Hbl6 c2	Hbl6 b3	Hbl7 1	Hbl7 2	Hbl7 3	Hbl7 4	Hbl7 5	Hbl7 6	Hbl7 7	Hbl8 1	Hbl8 2	Hbl8 3	Hbl9.1 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	51.52	44.18	51.51	44.79	43.21	45.04	49.61	50.24	42.44	40.92	39.19	44.51	43.17
TiO_2	0.29	0.65	0.36	0.92	1.31	1.21	0.36	0.39	0.64	1.67	1.12	1.04	0.13
Al_2O_3	4.65	11.42	4.18	9.96	11.91	10.51	5.99	5.05	13.12	14.12	15.93	10.96	12.89
FeO (total)	14.43	16.80	15.85	17.78	18.08	17.69	16.58	15.45	17.87	18.87	18.90	17.51	20.00
MnO	0.25	0.21	0.21	0.16	0.17	0.18	0.19	0.20	0.20	0.18	0.16	0.20	0.14
MgO	14.38	10.30	13.64	10.24	9.22	10.20	12.73	13.33	9.32	7.89	7.39	10.28	8.47
CaO	11.49	11.50	11.51	11.48	11.34	11.45	11.45	11.78	11.46	11.29	11.44	11.34	11.19
Na_2O	0.58	1.24	0.51	1.22	1.43	1.23	0.72	0.68	1.40	1.57	1.58	1.31	1.34
K_2O	0.22	0.90	0.19	0.79	1.00	0.84	0.35	0.28	1.13	1.53	1.66	0.93	1.07
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.03	0.02	0.01	*n.d.*	*n.d.*	0.01	*n.d.*	0.04	0.02	0.02	0.04	0.01	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.84	97.21	97.97	97.34	97.68	98.38	97.98	97.45	97.60	98.05	97.42	98.09	98.43
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	7.40	6.59	7.44	6.69	6.48	6.66	7.23	7.34	6.35	6.18	5.97	6.55	6.43
Ti	0.03	0.07	0.04	0.10	0.15	0.13	0.04	0.04	0.07	0.19	0.13	0.12	0.01
Al	0.79	2.01	0.71	1.75	2.10	1.83	1.03	0.87	2.31	2.51	2.86	1.90	2.26
Fe^{2+}	1.27	1.77	1.48	1.90	2.02	1.92	1.66	1.60	1.84	2.17	2.10	1.51	2.01
Mn	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.02
Mg	3.08	2.29	2.94	2.28	2.06	2.25	2.77	2.90	2.08	1.78	1.68	2.25	1.88
Ca	1.77	1.84	1.78	1.84	1.82	1.81	1.79	1.84	1.84	1.83	1.87	1.79	1.79
Na	0.16	0.36	0.14	0.35	0.42	0.35	0.20	0.19	0.41	0.46	0.47	0.38	0.39
K	0.04	0.17	0.03	0.15	0.19	0.16	0.06	0.05	0.21	0.29	0.32	0.17	0.20
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.46	0.32	0.43	0.32	0.24	0.27	0.36	0.28	0.40	0.21	0.31	0.65	0.49
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.04	15.44	15.03	15.42	15.51	15.41	15.17	15.16	15.53	15.65	15.72	15.34	15.48

Mineral							Amphibole						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Hbl9.2 c1	Hbl9.3 c1	Hbl10 1	Hbl10 2	Hbl10 3	Hbl10 4	Hbl10 5	Hbl10 6	Hbl10 7	Hbl10 8	Hbl11 1	Hbl11 2	Hbl11 3
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	41.23	40.45	45.94	51.65	52.77	52.11	52.86	52.99	51.98	41.85	42.05	51.11	51.16
TiO_2	0.18	0.13	0.81	0.32	0.26	0.45	0.27	0.30	0.30	0.76	0.67	0.27	0.41
Al_2O_3	15.22	16.02	9.97	4.82	3.36	3.57	3.40	3.12	4.59	13.91	14.15	5.25	5.16
FeO (total)	19.36	19.97	15.61	13.66	13.29	12.66	13.42	14.07	15.53	16.69	17.39	15.04	14.74
MnO	0.13	0.17	0.17	0.19	0.21	0.20	0.19	0.18	0.15	0.14	0.20	0.22	0.23
MgO	7.81	7.47	11.61	14.77	15.52	15.63	15.52	15.02	13.73	9.31	9.21	14.02	14.07
CaO	11.37	11.44	11.59	11.92	12.00	11.96	11.70	11.64	11.48	11.54	11.43	11.38	11.52
Na_2O	1.43	1.50	1.20	0.52	0.43	0.42	0.39	0.38	0.58	1.48	1.57	0.65	0.62
K_2O	1.34	1.51	0.76	0.23	0.15	0.16	0.14	0.17	0.23	1.25	1.20	0.25	0.23
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.05	0.02	0.03	*n.d.*	0.02	0.02	0.01	0.04	0.01	0.03	0.06	0.01	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.12	98.68	97.69	98.08	98.01	97.18	97.90	97.91	98.58	96.96	97.93	98.21	98.16
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.18	6.05	6.72	7.42	7.56	7.52	7.56	7.64	7.48	6.30	6.27	7.33	7.34
Ti	0.02	0.01	0.09	0.03	0.03	0.05	0.03	0.03	0.03	0.09	0.08	0.03	0.04
Al	2.69	2.82	1.72	0.82	0.57	0.61	0.57	0.53	0.78	2.47	2.49	0.89	0.87
Fe^{2+}	2.00	2.00	1.37	1.40	1.38	1.30	1.27	1.58	1.70	1.86	1.85	1.27	1.27
Mn	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
Mg	1.74	1.67	2.53	3.16	3.32	3.36	3.31	3.23	2.95	2.09	2.05	3.00	3.01
Ca	1.83	1.83	1.82	1.83	1.84	1.85	1.79	1.80	1.77	1.86	1.83	1.75	1.77
Na	0.42	0.44	0.34	0.14	0.12	0.12	0.11	0.11	0.16	0.43	0.45	0.18	0.17
K	0.26	0.29	0.14	0.04	0.03	0.03	0.03	0.03	0.04	0.24	0.23	0.05	0.04
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.43	0.50	0.54	0.24	0.22	0.23	0.33	0.11	0.17	0.24	0.32	0.54	0.50
Zn	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.58	15.63	15.30	15.11	15.09	15.09	15.03	15.08	15.11	15.60	15.59	15.05	15.04

Mineral							Amphibole						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Hbl11 4	Hbl11 5	Hbl11 6	Hbl11 7	Hbl12 1	Hbl12 2	Hbl12 3	Hbl12 4	Hbl12 5	Hbl12 6	Hbl13.1 1	Hbl13.1 2	Hbl13.1 3
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	51.63	43.71	51.14	43.09	43.06	51.67	51.85	52.11	51.07	41.27	42.50	42.71	43.23
TiO_2	0.28	0.55	0.33	0.71	0.71	0.45	0.57	0.37	0.35	0.86	1.36	1.30	1.10
Al_2O_3	4.66	12.41	5.08	13.05	13.49	4.89	4.04	4.32	5.43	15.15	11.69	12.12	11.03
FeO (total)	14.42	16.64	14.66	17.57	15.43	12.56	12.68	12.49	13.76	17.13	18.72	19.25	19.52
MnO	0.22	0.20	0.25	0.19	0.19	0.22	0.22	0.22	0.23	0.19	0.13	0.15	0.15
MgO	14.48	10.28	13.95	9.48	10.27	15.20	15.57	15.26	14.45	8.93	8.70	8.44	8.79
CaO	11.50	11.60	11.52	11.36	11.56	12.04	12.02	11.83	11.75	11.54	11.25	11.37	11.21
Na_2O	0.54	1.35	0.63	1.42	1.40	0.55	0.48	0.51	0.59	1.52	1.40	1.43	1.43
K_2O	0.20	1.03	0.24	1.13	1.20	0.24	0.17	0.22	0.29	1.47	1.15	1.18	0.97
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.01	*n.d.*	0.05	0.04	*n.d.*	0.06	0.03	*n.d.*	0.01	0.03	0.02	0.01	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.94	97.76	97.84	98.03	97.32	97.86	97.63	97.33	97.93	98.09	96.91	97.96	97.43
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	7.41	6.48	7.40	6.41	6.40	7.37	7.45	7.51	7.32	6.16	6.46	6.43	6.53
Ti	0.03	0.06	0.04	0.08	0.08	0.05	0.06	0.04	0.04	0.10	0.16	0.15	0.13
Al	0.79	2.17	0.87	2.29	2.36	0.82	0.68	0.73	0.92	2.66	2.09	2.15	1.96
Fe^{2+}	1.28	1.73	1.55	1.87	1.70	1.05	1.26	1.36	1.16	1.87	2.14	2.20	2.15
Mn	0.03	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02
Mg	3.10	2.27	3.01	2.10	2.28	3.23	3.33	3.28	3.09	1.99	1.97	1.90	1.98
Ca	1.77	1.84	1.79	1.81	1.84	1.84	1.85	1.83	1.80	1.85	1.83	1.83	1.81
Na	0.15	0.39	0.18	0.41	0.40	0.15	0.13	0.14	0.16	0.44	0.41	0.42	0.42
K	0.04	0.19	0.04	0.21	0.23	0.04	0.03	0.04	0.05	0.28	0.22	0.23	0.19
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.45	0.33	0.22	0.32	0.22	0.44	0.26	0.15	0.49	0.27	0.24	0.23	0.31
Zn	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.04	15.50	15.13	15.52	15.54	15.04	15.10	15.10	15.05	15.64	15.54	15.55	15.51

Mineral							Amphibole						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Hbl13.2 1	Hbl13.2 2	Hbl13.2 3	Hbl13.2 4	Hbl14.3 c1	Hbl14.2 c1	Hbl14.1 c1	Hbl1 b1	Hbl1 c1	Hbl1 c2	Hbl1 c3	Hbl1 c4	Hbl1 b2
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	42.70	41.28	43.27	39.78	40.61	41.45	40.68	41.07	46.72	49.11	49.56	48.59	43.17
TiO_2	1.36	1.41	1.31	1.43	0.39	0.78	0.56	0.75	0.51	0.44	0.58	0.60	0.96
Al_2O_3	11.93	13.18	11.39	14.75	16.50	14.60	15.85	14.13	8.96	6.42	6.17	6.32	11.75
FeO (total)	19.09	19.35	18.86	19.95	17.18	17.44	17.12	19.79	18.39	17.45	17.64	17.31	18.92
MnO	0.15	0.15	0.16	0.15	0.21	0.21	0.21	0.25	0.28	0.27	0.31	0.28	0.27
MgO	8.71	8.00	9.05	6.97	8.33	8.96	8.65	7.66	10.49	11.94	11.97	11.99	9.00
CaO	11.29	11.30	11.34	11.32	11.23	11.58	11.52	11.12	11.13	11.31	11.23	11.16	11.34
Na_2O	1.45	1.52	1.40	1.60	1.57	1.47	1.51	1.72	1.15	0.86	0.84	0.91	1.54
K_2O	1.20	1.29	1.10	1.65	1.39	1.33	1.49	1.27	0.59	0.36	0.35	0.39	1.04
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.01	0.01	0.02	0.01	0.02	0.02	0.01	0.05	*n.d.*	0.01	0.06	0.03	0.04
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.90	97.48	97.91	97.61	97.43	97.84	97.60	97.82	98.22	98.18	98.71	97.57	98.03
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.43	6.23	6.50	6.08	6.05	6.20	6.10	6.22	6.89	7.12	7.22	7.09	6.47
Ti	0.15	0.16	0.15	0.16	0.04	0.09	0.06	0.09	0.06	0.05	0.06	0.07	0.11
Al	2.12	2.35	2.02	2.66	2.89	2.57	2.80	2.52	1.56	1.10	1.06	1.09	2.08
Fe^{2+}	2.15	1.92	2.11	2.34	1.51	1.85	1.84	2.17	1.90	1.38	1.83	1.33	2.07
Mn	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03
Mg	1.96	1.80	2.03	1.59	1.85	2.00	1.93	1.73	2.31	2.58	2.60	2.61	2.01
Ca	1.82	1.83	1.82	1.85	1.79	1.86	1.85	1.80	1.76	1.76	1.75	1.74	1.82
Na	0.42	0.44	0.41	0.47	0.45	0.43	0.44	0.50	0.33	0.24	0.24	0.26	0.45
K	0.23	0.25	0.21	0.32	0.26	0.25	0.28	0.25	0.11	0.07	0.07	0.07	0.20
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.26	0.52	0.26	0.21	0.63	0.33	0.31	0.34	0.37	0.74	0.32	0.78	0.30
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.56	15.52	15.52	15.72	15.51	15.60	15.64	15.65	15.31	15.07	15.18	15.07	15.55

Mineral							Amphibole						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Hbl1 c5	Hbl1 b3	Hbl13 b1	Hbl13 c1	Hbl13 c2	Hbl13 c3	Hbl13 c4	Hbl13 ex1	Hbl13 c5	Hbl13 ex2	Hbl13 ex3	Hbl13 c6	Hbl13 c7
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	41.70	41.70	42.42	46.52	42.09	48.53	49.91	51.72	52.66	52.66	53.36	51.99	45.63
TiO_2	1.25	1.19	0.70	0.49	0.94	0.48	0.52	0.27	0.31	0.13	0.05	0.31	0.83
Al_2O_3	13.11	13.51	12.68	9.32	12.86	6.60	5.48	3.71	2.75	1.37	0.29	3.57	9.52
FeO (total)	19.49	19.52	19.62	18.61	19.90	17.86	17.65	21.04	19.85	24.68	28.23	17.44	18.82
MnO	0.26	0.27	0.27	0.28	0.25	0.31	0.31	0.48	0.42	0.76	0.85	0.33	0.29
MgO	7.98	7.99	8.38	10.03	8.03	11.39	12.19	13.00	13.79	14.03	14.27	13.44	9.99
CaO	11.20	11.08	11.04	11.17	11.12	11.17	11.05	7.89	8.76	4.01	0.96	10.75	11.02
Na_2O	1.65	1.75	1.62	1.19	1.61	0.91	0.85	0.54	0.38	0.24	0.05	0.53	1.25
K_2O	1.22	1.23	1.07	0.66	1.08	0.36	0.34	0.18	0.13	0.03	0.01	0.20	0.68
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.04	0.01	0.01	0.02	0.03	*n.d.*	0.01	*n.d.*	0.04	0.05	0.04	*n.d.*	0.06
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.90	98.25	97.80	98.29	97.91	97.61	98.32	98.83	99.09	97.97	98.11	98.56	98.09
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.30	6.27	6.39	6.87	6.35	7.16	7.29	7.55	7.61	7.81	7.96	7.54	6.71
Ti	0.14	0.13	0.08	0.05	0.11	0.05	0.06	0.03	0.03	0.01	0.01	0.03	0.09
Al	2.34	2.40	2.25	1.62	2.29	1.15	0.94	0.64	0.47	0.24	0.05	0.61	1.65
Fe^{2+}	2.20	2.17	2.10	1.98	2.17	1.85	1.85	2.39	2.07	2.96	3.50	1.92	1.53
Mn	0.03	0.03	0.03	0.04	0.03	0.04	0.04	0.06	0.05	0.10	0.11	0.04	0.04
Mg	1.80	1.79	1.88	2.21	1.81	2.51	2.65	2.83	2.97	3.10	3.18	2.91	2.19
Ca	1.81	1.79	1.78	1.77	1.80	1.77	1.73	1.23	1.36	0.64	0.15	1.67	1.74
Na	0.48	0.51	0.47	0.34	0.47	0.26	0.24	0.15	0.11	0.07	0.01	0.15	0.36
K	0.24	0.24	0.20	0.12	0.21	0.07	0.06	0.03	0.02	0.01	0.00	0.04	0.13
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.26	0.29	0.37	0.32	0.34	0.35	0.31	0.18	0.33	0.10	0.02	0.20	0.79
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.61	15.62	15.56	15.33	15.57	15.20	15.18	15.10	15.02	15.04	15.00	15.11	15.22

Mineral							Amphibole						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Hbl13 b2	Hbl2 1	Hbl2 2	Hbl2 3	Hbl2 4	Hbl2 5	Hbl3 2	Hbl3 3	Hbl3 4	Hbl3 5	Hbl3 6	Hbl3 7	Hbl3 8
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	42.26	44.72	48.61	51.56	40.14	53.76	42.42	51.05	51.52	50.41	48.28	40.43	44.83
TiO_2	0.95	1.16	0.68	0.29	0.74	0.29	0.97	0.46	0.48	0.62	0.66	1.05	0.93
Al_2O_3	12.88	10.09	6.56	4.40	15.51	3.22	12.82	4.65	4.74	4.61	6.87	14.90	10.30
FeO (total)	19.30	18.63	17.43	16.49	19.68	9.16	19.68	16.58	16.26	16.51	16.94	19.64	18.44
MnO	0.23	0.24	0.26	0.27	0.22	0.18	0.23	0.27	0.25	0.27	0.27	0.21	0.25
MgO	8.26	9.43	11.76	13.39	7.36	17.88	8.23	12.90	12.91	12.77	11.65	7.52	9.81
CaO	11.18	11.30	11.27	11.59	11.20	12.40	11.31	11.40	11.39	11.49	11.48	11.30	11.38
Na_2O	1.63	1.37	0.91	0.57	1.69	0.47	1.65	0.66	0.67	0.68	0.94	1.68	1.37
K_2O	1.08	0.92	0.42	0.22	1.52	0.05	1.19	0.24	0.27	0.29	0.48	1.52	0.87
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.02	0.01	0.01	0.04	*n.d.*	0.01	0.05	*n.d.*	*n.d.*	0.01	0.03	0.02	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.79	97.88	97.89	98.81	98.06	97.41	98.55	98.21	98.49	97.65	97.60	98.27	98.18
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.37	6.69	7.14	7.44	6.07	7.58	6.36	7.43	7.46	7.39	7.12	6.11	6.67
Ti	0.11	0.13	0.07	0.03	0.08	0.03	0.11	0.05	0.05	0.07	0.07	0.12	0.10
Al	2.29	1.78	1.14	0.75	2.76	0.53	2.27	0.80	0.81	0.80	1.19	2.65	1.81
Fe^{2+}	2.15	2.10	1.81	1.73	2.14	0.71	2.20	1.79	1.80	1.77	1.83	2.19	2.02
Mn	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Mg	1.86	2.10	2.58	2.88	1.66	3.76	1.84	2.80	2.79	2.79	2.56	1.69	2.18
Ca	1.81	1.81	1.77	1.79	1.81	1.87	1.82	1.78	1.77	1.80	1.82	1.83	1.81
Na	0.48	0.40	0.26	0.16	0.50	0.13	0.48	0.19	0.19	0.19	0.27	0.49	0.40
K	0.21	0.18	0.08	0.04	0.29	0.01	0.23	0.04	0.05	0.05	0.09	0.29	0.17
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.28	0.23	0.34	0.27	0.35	0.37	0.27	0.23	0.17	0.25	0.26	0.30	0.28
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.58	15.46	15.21	15.12	15.69	15.01	15.61	15.13	15.12	15.15	15.26	15.69	15.46

Mineral							Amphibole						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Hbl4 1	Hbl4 2	Hbl4 3	Hbl4 4	Hbl4 5	Hbl4 6	Hbl4 7	Hbl4 8	Hbl4 9ex	Hbl4 10 ex	Hbl4 12 ex	Hbl5 1	Hbl5 2
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	38.57	41.48	50.03	50.44	50.91	46.99	45.09	41.50	52.12	51.60	51.11	45.08	40.12
TiO_2	1.39	1.19	0.51	0.49	0.37	0.84	0.84	0.81	0.13	0.30	0.44	1.31	1.34
Al_2O_3	16.47	13.02	5.49	4.13	3.92	8.08	9.85	13.48	1.48	2.14	2.99	10.07	14.00
FeO (total)	20.79	19.74	17.71	21.30	19.83	18.82	19.13	20.13	26.45	25.12	24.36	19.12	20.52
MnO	0.22	0.22	0.26	0.40	0.39	0.24	0.22	0.22	0.69	0.62	0.53	0.18	0.20
MgO	6.35	7.93	12.22	12.56	12.73	10.54	9.45	7.82	13.90	13.46	13.22	9.35	7.04
CaO	11.18	11.03	11.05	8.00	9.08	11.19	11.17	11.16	2.98	5.07	5.87	11.35	11.17
Na_2O	1.66	1.64	0.76	0.58	0.59	1.17	1.24	1.68	0.21	0.26	0.32	1.38	1.80
K_2O	1.75	1.24	0.28	0.26	0.24	0.54	0.72	1.25	0.08	0.16	0.21	0.84	1.52
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.03	0.04	0.02	0.01	0.04	0.02	0.05	*n.d.*	0.07	0.06	0.06	0.02	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.41	97.52	98.33	98.18	98.10	98.43	97.77	98.05	98.11	98.78	99.12	98.69	97.71
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	5.86	6.30	7.30	7.40	7.48	6.94	6.69	6.27	7.76	7.63	7.51	6.70	6.14
Ti	0.16	0.14	0.06	0.05	0.04	0.09	0.09	0.09	0.01	0.03	0.05	0.15	0.15
Al	2.95	2.33	0.94	0.71	0.68	1.41	1.72	2.40	0.26	0.37	0.52	1.76	2.52
Fe^{2+}	2.27	2.20	1.87	2.12	2.21	1.98	1.70	2.19	3.11	2.90	2.66	2.14	2.38
Mn	0.03	0.03	0.03	0.05	0.05	0.03	0.03	0.03	0.09	0.08	0.07	0.02	0.03
Mg	1.44	1.79	2.66	2.75	2.79	2.32	2.09	1.76	3.08	2.97	2.89	2.07	1.61
Ca	1.82	1.79	1.73	1.26	1.43	1.77	1.78	1.81	0.48	0.80	0.92	1.81	1.83
Na	0.49	0.48	0.22	0.17	0.17	0.33	0.36	0.49	0.06	0.07	0.09	0.40	0.53
K	0.34	0.24	0.05	0.05	0.05	0.10	0.14	0.24	0.02	0.03	0.04	0.16	0.30
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.37	0.31	0.29	0.50	0.22	0.35	0.67	0.35	0.18	0.21	0.33	0.24	0.24
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.73	15.61	15.16	15.05	15.13	15.31	15.27	15.63	15.05	15.10	15.09	15.44	15.74

Mineral							Amphibole						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Hbl5 3	Hbl6 1	Hbl6 2	Hbl6 3	Hbl6 4	Hbl6 5	Hbl6 6	Hbl6 7	Hbl7 1	Hbl7 2	Hbl7 3	Hbl7 4	Hbl7 5
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	38.55	47.50	44.67	40.96	43.78	40.87	48.30	40.08	42.26	39.06	40.72	45.06	38.97
TiO_2	1.25	0.45	1.07	1.72	1.32	1.61	0.81	0.33	1.25	1.66	1.65	1.14	0.50
Al_2O_3	16.01	7.88	10.66	13.27	11.06	13.55	6.77	16.38	12.54	15.23	13.52	9.53	17.42
FeO (total)	20.65	17.97	18.98	19.88	19.33	20.43	18.06	19.13	19.65	20.85	20.56	18.62	19.46
MnO	0.19	0.24	0.21	0.22	0.25	0.24	0.25	0.23	0.24	0.22	0.24	0.24	0.23
MgO	6.22	11.27	9.29	7.76	9.17	7.42	11.33	7.29	8.23	6.54	7.51	9.82	6.85
CaO	11.17	11.20	11.22	11.18	11.23	11.34	11.16	11.22	11.39	11.14	11.23	11.19	11.16
Na_2O	1.76	1.07	1.43	1.74	1.53	1.76	0.99	1.70	1.68	1.77	1.80	1.32	1.65
K_2O	1.73	0.48	0.83	1.38	0.96	1.50	0.46	1.64	1.26	1.70	1.45	0.79	1.61
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.05	0.04	*n.d.*	0.04	0.01	*n.d.*	0.02	0.05	0.04	*n.d.*	0.02	*n.d.*	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.57	98.10	98.36	98.16	98.65	98.72	98.14	98.05	98.54	98.18	98.70	97.71	97.87
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	5.92	6.98	6.65	6.21	6.52	6.18	7.10	6.01	6.36	5.93	6.12	6.74	5.89
Ti	0.14	0.05	0.12	0.20	0.15	0.18	0.09	0.04	0.14	0.19	0.19	0.13	0.06
Al	2.90	1.37	1.87	2.37	1.94	2.42	1.17	2.89	2.22	2.72	2.39	1.68	3.10
Fe^{2+}	2.38	1.78	2.09	2.26	2.10	2.36	1.88	1.79	2.24	2.08	2.01	2.04	2.05
Mn	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Mg	1.42	2.47	2.06	1.75	2.04	1.67	2.48	1.63	1.85	1.48	1.68	2.19	1.54
Ca	1.84	1.76	1.79	1.82	1.79	1.84	1.76	1.80	1.84	1.81	1.81	1.79	1.81
Na	0.52	0.30	0.41	0.51	0.44	0.52	0.28	0.49	0.49	0.52	0.52	0.38	0.48
K	0.34	0.09	0.16	0.27	0.18	0.29	0.09	0.31	0.24	0.33	0.28	0.15	0.31
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.27	0.43	0.28	0.26	0.31	0.23	0.34	0.60	0.23	0.56	0.57	0.29	0.41
Zn	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.78	15.27	15.45	15.67	15.51	15.71	15.23	15.61	15.64	15.66	15.61	15.42	15.69

Mineral							Amphibole						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Hbl8 1	Hbl8 2	Hbl8 3	Hbl8 4	Hbl8 5	Hbl9 1	Hbl9 2	Hbl9 3	Hbl10 1	Hbl10 2	Hbl10 3	Hbl10 4	Hbl10 5
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	43.23	40.88	42.70	41.97	42.06	43.01	46.87	42.58	44.17	51.31	51.15	49.96	42.60
TiO_2	0.79	1.18	1.01	1.69	1.51	1.72	0.92	1.40	1.22	0.41	0.35	0.57	1.10
Al_2O_3	12.21	14.87	12.63	12.82	12.90	11.93	8.39	12.09	10.97	4.50	4.33	5.51	12.87
FeO (total)	19.13	19.23	19.24	19.20	19.24	19.07	18.17	19.04	18.06	16.18	15.01	15.85	18.68
MnO	0.25	0.22	0.23	0.23	0.21	0.26	0.26	0.24	0.23	0.29	0.27	0.25	0.24
MgO	8.68	7.63	8.48	8.28	8.30	8.71	10.68	8.64	9.37	13.18	13.41	12.87	8.58
CaO	11.32	11.31	11.25	11.18	11.27	11.18	11.18	11.16	11.30	11.39	11.60	11.50	11.58
Na_2O	1.63	1.72	1.57	1.59	1.62	1.61	1.15	1.55	1.50	0.61	0.56	0.75	1.56
K_2O	1.01	1.35	1.07	1.25	1.23	1.12	0.56	1.14	1.00	0.26	0.19	0.34	1.21
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.01	*n.d.*	0.02	0.01	0.05	0.02	0.05	0.02	0.03	0.02	0.01	0.05	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.26	98.39	98.20	98.22	98.39	98.63	98.22	97.86	97.84	98.16	96.88	97.65	98.42
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.47	6.15	6.40	6.31	6.32	6.43	6.91	6.41	6.61	7.46	7.50	7.30	6.38
Ti	0.09	0.13	0.11	0.19	0.17	0.19	0.10	0.16	0.14	0.04	0.04	0.06	0.12
Al	2.15	2.64	2.23	2.27	2.28	2.10	1.46	2.15	1.93	0.77	0.75	0.95	2.27
Fe^{2+}	2.13	2.18	2.13	2.16	2.17	2.14	1.91	2.12	2.06	1.77	1.67	1.66	2.15
Mn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03
Mg	1.94	1.71	1.90	1.86	1.86	1.94	2.35	1.94	2.09	2.85	2.93	2.80	1.92
Ca	1.82	1.82	1.81	1.80	1.81	1.79	1.77	1.80	1.81	1.77	1.82	1.80	1.86
Na	0.47	0.50	0.46	0.46	0.47	0.47	0.33	0.45	0.44	0.17	0.16	0.21	0.45
K	0.19	0.26	0.20	0.24	0.24	0.21	0.11	0.22	0.19	0.05	0.04	0.06	0.23
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.26	0.24	0.28	0.25	0.25	0.25	0.33	0.27	0.20	0.20	0.17	0.27	0.19
Zn	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.56	15.66	15.56	15.58	15.60	15.55	15.31	15.56	15.50	15.12	15.10	15.16	15.60

Mineral							Amphibole						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 XII 8B	09 XII 8B
Anl code	Hbl11 1	Hbl11 2	Hbl11 3	Hbl11 4	Hbl11 5	Hbl12 2	Hbl12 3	Hbl12 4	Hbl12 5	Hbl12 6	Hbl12 7	Hbl1.1 c1	Hbl1.2 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Fol metgb	Fol metgb
SiO_2	39.53	40.28	40.29	45.83	41.52	49.46	51.46	49.88	51.84	43.13	39.85	44.04	38.52
TiO_2	1.44	1.43	1.20	0.52	0.58	0.50	0.38	0.57	0.33	0.96	0.53	1.12	1.61
Al_2O_3	14.50	14.04	14.46	9.52	13.50	5.60	3.90	5.52	3.67	11.68	16.92	10.17	15.86
FeO (total)	20.20	20.52	20.05	19.00	19.96	17.18	16.75	17.08	16.27	19.15	19.60	17.84	20.17
MnO	0.21	0.23	0.17	0.24	0.20	0.29	0.32	0.29	0.29	0.29	0.29	0.19	0.22
MgO	6.97	7.11	7.12	9.89	7.63	12.20	13.19	12.13	13.28	8.68	6.88	9.68	6.90
CaO	11.12	11.14	11.25	11.25	11.17	11.14	11.29	11.22	11.45	11.17	11.15	11.17	11.33
Na_2O	1.74	1.75	1.61	1.30	1.58	0.82	0.56	0.76	0.51	1.63	1.71	1.28	1.67
K_2O	1.59	1.45	1.44	0.64	1.23	0.31	0.21	0.38	0.13	1.00	1.51	0.83	1.86
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.d.*	0.05	0.02	0.05	0.01	0.01	0.02	0.02	0.01	0.01	0.03	0.02	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.30	97.99	97.61	98.23	97.38	97.51	98.07	97.86	97.79	97.70	98.47	96.33	98.16
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.07	6.14	6.11	6.80	6.31	7.27	7.46	7.31	7.56	6.50	5.95	6.67	5.87
Ti	0.17	0.16	0.14	0.06	0.07	0.06	0.04	0.06	0.04	0.11	0.06	0.13	0.18
Al	2.62	2.52	2.58	1.66	2.42	0.97	0.67	0.95	0.63	2.07	2.98	1.82	2.85
Fe^{2+}	2.34	2.34	2.02	2.00	2.22	1.80	1.58	1.84	1.81	2.15	1.79	1.99	2.22
Mn	0.03	0.03	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.02	0.03
Mg	1.60	1.61	1.61	2.19	1.73	2.67	2.85	2.65	2.89	1.95	1.53	2.19	1.57
Ca	1.83	1.82	1.83	1.79	1.82	1.76	1.75	1.76	1.79	1.80	1.78	1.81	1.85
Na	0.52	0.52	0.47	0.37	0.47	0.23	0.16	0.22	0.15	0.48	0.49	0.38	0.49
K	0.31	0.28	0.28	0.12	0.24	0.06	0.04	0.07	0.02	0.19	0.29	0.16	0.36
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.26	0.27	0.53	0.35	0.32	0.32	0.45	0.25	0.17	0.27	0.66	0.27	0.35
Zn	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.74	15.70	15.58	15.38	15.61	15.17	15.04	15.16	15.09	15.55	15.57	15.43	15.77

Mineral							Amphibole						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Hbl1.3 c1	Hbl1.4 c1	Hbl1.5 c1	Hbl1.4 c3	Hbl2 1	Hbl2 2	Hbl2 3	Hbl2 4	Hbl2 5	Hbl2 6	Hbl2 7	Hbl2 8	Hbl2 9
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	42.97	43.91	41.78	46.12	50.89	51.50	51.52	49.14	50.87	50.21	45.39	48.36	43.85
TiO_2	1.24	0.98	1.37	0.77	0.45	0.37	0.45	0.48	0.37	0.37	0.71	0.56	0.75
Al_2O_3	11.70	11.20	12.63	8.87	4.86	4.47	3.73	5.89	4.08	5.21	9.69	7.15	11.37
FeO (total)	18.39	18.30	18.64	17.33	14.93	14.75	14.01	15.22	14.76	15.31	17.17	15.99	17.90
MnO	0.21	0.21	0.20	0.21	0.29	0.25	0.26	0.28	0.26	0.24	0.23	0.25	0.24
MgO	9.18	9.55	8.50	10.72	13.66	14.01	14.58	13.17	14.17	13.39	10.91	12.34	9.92
CaO	11.28	11.29	11.50	11.36	11.51	11.64	11.96	11.76	11.42	11.56	11.44	11.48	11.49
Na_2O	1.46	1.39	1.50	1.13	0.66	0.63	0.51	0.78	0.51	0.71	1.19	0.93	1.34
K_2O	1.15	0.97	1.30	0.68	0.26	0.24	0.18	0.34	0.27	0.32	0.81	0.48	0.94
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.04	0.06	0.02	0.04	0.04	0.02	0.07	0.04	0.01	0.02	0.03	*n.d.*	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.61	97.86	97.44	97.24	97.54	97.87	97.26	97.10	96.72	97.34	97.57	97.54	97.83
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.46	6.52	6.31	6.87	7.40	7.46	7.48	7.21	7.45	7.29	6.74	7.05	6.53
Ti	0.14	0.11	0.16	0.09	0.05	0.04	0.05	0.05	0.04	0.04	0.08	0.06	0.08
Al	2.07	1.96	2.25	1.56	0.83	0.76	0.64	1.02	0.70	0.89	1.69	1.23	2.00
Fe^{2+}	2.05	1.65	1.93	1.89	1.59	1.57	1.44	1.54	1.55	1.26	1.76	1.34	1.85
Mn	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03
Mg	2.06	2.11	1.91	2.38	2.96	3.02	3.16	2.88	3.09	2.90	2.41	2.68	2.20
Ca	1.82	1.80	1.86	1.81	1.79	1.81	1.86	1.85	1.79	1.80	1.82	1.79	1.83
Na	0.43	0.40	0.44	0.33	0.18	0.18	0.14	0.22	0.14	0.20	0.34	0.26	0.39
K	0.22	0.18	0.25	0.13	0.05	0.04	0.03	0.06	0.05	0.06	0.15	0.09	0.18
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.27	0.62	0.42	0.27	0.23	0.22	0.26	0.33	0.26	0.60	0.37	0.61	0.38
Zn	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.55	15.38	15.55	15.36	15.13	15.13	15.10	15.21	15.12	15.06	15.40	15.15	15.48

Mineral							Amphibole						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Hbl2 10	Hbl3 1	Hbl3 2	Hbl3 3	Hbl3 4	Hbl3 5	Hbl3 6	Hbl3 7	Hbl3 8	Hbl4.1 c1	Hbl4.2 c1	Hbl4.3 c1	Hbl4.3 c2
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	40.98	48.07	48.33	46.34	52.06	49.52	49.29	52.57	41.46	39.17	38.83	44.50	44.13
TiO_2	0.78	0.78	0.63	0.66	0.29	0.46	0.44	0.20	0.98	0.58	0.95	0.53	0.57
Al_2O_3	14.73	7.75	6.49	9.13	3.61	5.90	6.09	3.43	14.06	16.55	16.91	10.99	11.68
FeO (total)	18.32	14.64	16.16	16.01	15.28	16.15	16.09	14.75	18.43	18.93	18.50	17.76	17.63
MnO	0.24	0.23	0.21	0.26	0.25	0.25	0.25	0.27	0.22	0.20	0.21	0.24	0.25
MgO	8.39	12.55	12.29	11.50	14.15	12.83	12.55	14.39	8.16	7.33	7.21	10.17	9.84
CaO	11.33	11.83	11.80	11.81	11.64	11.54	11.56	11.63	11.36	11.53	11.35	11.41	11.48
Na_2O	1.61	1.10	0.86	1.18	0.48	0.79	0.79	0.45	1.56	1.58	1.59	1.30	1.38
K_2O	1.36	0.25	0.54	0.57	0.17	0.36	0.39	0.17	1.37	1.78	1.88	0.79	0.96
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.03	0.03	0.01	0.07	0.05	0.02	*n.d.*	0.01	0.04	0.01	0.01	*n.d.*	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.77	97.22	97.31	97.53	97.97	97.83	97.47	97.87	97.63	97.67	97.44	97.69	97.95
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.16	7.06	7.14	6.85	7.54	7.23	7.19	7.60	6.26	5.94	5.91	6.61	6.56
Ti	0.09	0.09	0.07	0.07	0.03	0.05	0.05	0.02	0.11	0.07	0.11	0.06	0.06
Al	2.61	1.34	1.13	1.59	0.62	1.02	1.05	0.58	2.50	2.96	3.03	1.92	2.05
Fe^{2+}	1.96	1.62	1.74	1.71	1.64	1.63	1.38	1.64	2.11	2.06	2.10	1.80	1.89
Mn	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Mg	1.88	2.75	2.70	2.53	3.05	2.79	2.73	3.10	1.84	1.66	1.64	2.25	2.18
Ca	1.83	1.86	1.87	1.87	1.81	1.80	1.81	1.80	1.84	1.87	1.85	1.82	1.83
Na	0.47	0.31	0.25	0.34	0.13	0.22	0.22	0.13	0.46	0.46	0.47	0.37	0.40
K	0.26	0.05	0.10	0.11	0.03	0.07	0.07	0.03	0.26	0.34	0.36	0.15	0.18
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.34	0.18	0.26	0.26	0.21	0.34	0.58	0.14	0.22	0.34	0.26	0.40	0.31
Zn	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.64	15.28	15.28	15.38	15.10	15.19	15.10	15.09	15.63	15.74	15.75	15.43	15.49

Mineral							Amphibole						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Hbl4.4 c1	Hbl4.5 c1	Hbl9 1	Hbl9 2	Hbl9 3	Hbl9 5	Hbl9 6	Hbl9 7	Hbl9 8	Hbl9 9	Hbl9 10	Hbl9 11	Hbl5 1
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	41.25	48.52	39.50	49.88	52.65	47.40	40.74	41.37	53.44	50.24	50.75	40.67	40.33
TiO_2	1.02	0.45	1.58	0.56	0.24	0.72	0.99	1.09	0.17	0.59	0.35	0.86	1.63
Al_2O_3	13.89	6.99	15.19	5.72	2.58	7.80	14.34	13.69	2.46	5.57	4.23	14.41	13.25
FeO (total)	18.76	16.39	19.44	15.71	15.07	16.95	19.39	18.19	12.70	14.35	15.89	19.46	20.08
MnO	0.20	0.24	0.17	0.23	0.23	0.21	0.20	0.19	0.23	0.21	0.25	0.22	0.21
MgO	8.41	12.19	7.23	12.99	14.67	11.67	7.98	8.46	16.06	13.71	13.62	7.99	7.53
CaO	11.52	11.63	11.36	11.53	11.62	11.49	11.17	11.49	11.81	11.66	11.55	11.30	11.27
Na_2O	1.55	0.84	1.58	0.76	0.37	0.98	1.59	1.60	0.30	0.72	0.53	1.60	1.64
K_2O	1.35	0.51	1.67	0.36	0.11	0.57	1.45	1.38	0.06	0.27	0.20	1.37	1.47
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.01	*n.d.*	0.03	0.04	0.06	0.01	0.02	*n.d.*	*n.d.*	0.02	0.03	0.01	0.05
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.95	97.76	97.74	97.77	97.60	97.80	97.87	97.46	97.24	97.34	97.39	97.90	97.46
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.21	7.12	6.02	7.27	7.64	6.98	6.15	6.26	7.70	7.31	7.41	6.14	6.17
Ti	0.12	0.05	0.18	0.06	0.03	0.08	0.11	0.12	0.02	0.06	0.04	0.10	0.19
Al	2.46	1.21	2.73	0.98	0.44	1.35	2.55	2.44	0.42	0.96	0.73	2.56	2.39
Fe^{2+}	2.04	1.70	2.23	1.63	1.62	1.74	2.07	2.10	1.39	1.50	1.61	2.04	2.29
Mn	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03
Mg	1.89	2.67	1.64	2.82	3.17	2.56	1.80	1.91	3.45	2.97	2.97	1.80	1.72
Ca	1.86	1.83	1.85	1.80	1.81	1.81	1.81	1.86	1.82	1.82	1.81	1.83	1.85
Na	0.45	0.24	0.47	0.21	0.11	0.28	0.47	0.47	0.08	0.20	0.15	0.47	0.49
K	0.26	0.10	0.32	0.07	0.02	0.11	0.28	0.27	0.01	0.05	0.04	0.26	0.29
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.32	0.31	0.24	0.28	0.21	0.34	0.38	0.20	0.14	0.25	0.33	0.42	0.28
Zn	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.64	15.24	15.71	15.17	15.07	15.29	15.64	15.66	15.05	15.15	15.11	15.64	15.69

Mineral							Amphibole						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Hbl5 2	Hbl5 3	Hbl5 4	Hbl5 5	Hbl6.1 c1	Hbl6.2 c1	Hbl6.3 c1	Hbl6.4 c1	Hbl6.6 c1	Hbl6.7 c1	Hbl6.8 c1	Hbl6.9 c1	Hbl6.10 c1
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	41.60	41.53	41.98	41.11	44.89	42.83	49.80	44.52	52.45	52.55	49.59	43.27	43.75
TiO_2	1.16	1.44	1.55	1.37	1.11	1.26	0.45	1.00	0.25	0.38	0.39	0.82	0.89
Al_2O_3	12.85	12.94	12.30	13.58	9.78	11.97	5.52	9.79	2.82	2.87	5.65	11.84	11.10
FeO (total)	19.83	19.48	18.96	19.73	18.63	19.31	16.95	18.57	15.85	15.78	16.43	18.79	18.92
MnO	0.21	0.22	0.19	0.21	0.25	0.22	0.24	0.23	0.25	0.27	0.28	0.24	0.21
MgO	8.04	8.11	8.39	7.76	9.89	8.65	12.44	9.79	14.05	14.00	12.44	8.88	9.22
CaO	11.25	11.37	11.23	11.31	11.30	11.25	11.45	11.48	11.49	11.54	11.37	11.27	11.29
Na_2O	1.57	1.56	1.47	1.62	1.23	1.48	0.71	1.21	0.38	0.41	0.74	1.37	1.36
K_2O	1.26	1.38	1.29	1.47	0.78	1.13	0.36	0.88	0.15	0.14	0.38	1.03	0.96
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.d.*	*n.d.*	0.06	0.01	0.01	*n.d.*	*n.d.*	0.02	0.05	0.03	*n.d.*	0.05	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.77	98.03	97.42	98.17	97.87	98.10	97.93	97.49	97.75	97.97	97.28	97.57	97.74
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.30	6.25	6.37	6.22	6.69	6.43	7.29	6.68	7.63	7.63	7.29	6.51	6.56
Ti	0.13	0.16	0.18	0.16	0.12	0.14	0.05	0.11	0.03	0.04	0.04	0.09	0.10
Al	2.29	2.29	2.20	2.42	1.72	2.12	0.95	1.73	0.48	0.49	0.98	2.10	1.96
Fe^{2+}	2.19	1.95	2.17	2.25	1.97	2.14	1.77	2.00	1.76	1.78	1.74	2.06	2.04
Mn	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Mg	1.82	1.82	1.90	1.75	2.20	1.94	2.71	2.19	3.05	3.03	2.73	1.99	2.06
Ca	1.83	1.83	1.82	1.83	1.81	1.81	1.79	1.85	1.79	1.80	1.79	1.82	1.81
Na	0.46	0.45	0.43	0.48	0.35	0.43	0.20	0.35	0.11	0.12	0.21	0.40	0.40
K	0.24	0.26	0.25	0.28	0.15	0.22	0.07	0.17	0.03	0.03	0.07	0.20	0.18
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.32	0.50	0.24	0.24	0.35	0.28	0.31	0.33	0.17	0.14	0.28	0.30	0.33
Zn	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.61	15.55	15.58	15.67	15.40	15.55	15.17	15.44	15.08	15.08	15.17	15.50	15.48

Mineral							Amphibole						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Hbl6.11 c1	Hbl7 1	Hbl7 2	Hbl7 3	Hbl7 4	Hbl8.1 c1	Hbl8.2 c1	Hbl8.3 c1	Hbl8.4 c1	Hbl8.5 c1	Hbl8.6 c1	Hbl8.7 c1	Hbl8.8 c1
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	41.25	40.12	41.75	40.23	41.18	42.70	44.07	48.13	49.06	47.02	50.38	40.58	40.58
TiO_2	1.32	1.24	1.23	1.78	1.53	0.98	1.08	0.72	0.63	0.76	0.44	1.44	1.52
Al_2O_3	13.11	13.99	12.78	13.95	12.98	12.33	10.77	6.84	6.35	7.77	4.60	13.27	13.46
FeO (total)	19.76	19.72	19.40	19.99	19.44	18.73	18.29	16.86	16.59	17.19	16.10	19.25	19.40
MnO	0.24	0.22	0.19	0.23	0.20	0.24	0.23	0.26	0.24	0.25	0.24	0.22	0.19
MgO	7.79	7.42	8.18	7.43	7.97	8.82	9.64	11.65	12.01	11.13	13.12	7.99	8.03
CaO	11.26	11.21	11.36	11.25	11.29	11.44	11.28	11.51	11.67	11.59	11.62	11.35	11.27
Na_2O	1.59	1.59	1.48	1.59	1.51	1.40	1.38	0.86	0.80	1.02	0.60	1.54	1.63
K_2O	1.41	1.44	1.27	1.62	1.40	1.18	0.94	0.47	0.41	0.56	0.27	1.34	1.46
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.d.*	0.05	0.03	0.02	0.02	0.02	0.01	*n.d.*	0.01	0.01	*n.d.*	0.04	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.73	96.99	97.68	98.09	97.53	97.85	97.68	97.31	97.78	97.30	97.38	97.02	97.56
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.27	6.15	6.32	6.08	6.23	6.42	6.55	7.12	7.21	6.99	7.38	6.20	6.17
Ti	0.15	0.14	0.14	0.20	0.17	0.11	0.12	0.08	0.07	0.08	0.05	0.17	0.17
Al	2.35	2.53	2.28	2.48	2.31	2.18	1.89	1.19	1.10	1.36	0.79	2.39	2.41
Fe^{2+}	2.26	2.22	2.17	2.00	1.95	2.06	1.68	1.83	1.81	1.88	1.68	2.14	2.17
Mn	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02
Mg	1.77	1.70	1.85	1.67	1.80	1.98	2.14	2.57	2.63	2.47	2.87	1.82	1.82
Ca	1.83	1.84	1.84	1.82	1.83	1.84	1.80	1.82	1.84	1.85	1.82	1.86	1.84
Na	0.47	0.47	0.43	0.47	0.44	0.41	0.40	0.25	0.23	0.29	0.17	0.46	0.48
K	0.27	0.28	0.25	0.31	0.27	0.23	0.18	0.09	0.08	0.11	0.05	0.26	0.28
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.25	0.31	0.28	0.53	0.51	0.30	0.60	0.26	0.23	0.25	0.30	0.31	0.30
Zn	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.65	15.67	15.60	15.60	15.54	15.55	15.37	15.24	15.21	15.32	15.14	15.64	15.68

Mineral							Amphibole						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Hbl8.9 c1	Hbl8.10 c1	Hbl8.11 c1	Hbl8.12 c1	Hbl1 1	Hbl1 2	Hbl1 3	Hbl1 4	Hbl1 5	Hbl1 6	Hbl1 7	Hbl1 8	Hbl2 1
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	50.60	51.58	49.11	41.08	47.25	49.99	51.12	52.57	51.86	42.47	41.97	53.16	40.98
TiO_2	0.38	0.35	0.48	0.91	0.72	0.48	0.52	0.42	0.33	1.03	0.99	0.32	1.21
Al_2O_3	4.59	3.79	6.37	13.96	8.86	6.53	5.26	3.93	4.09	13.30	13.81	4.73	14.19
FeO (total)	16.29	15.71	16.40	19.30	16.17	15.55	14.87	14.02	13.51	16.47	17.37	13.29	19.21
MnO	0.28	0.27	0.24	0.23	0.16	0.17	0.19	0.20	0.20	0.14	0.15	0.17	0.15
MgO	13.30	13.59	12.37	8.05	12.08	13.53	14.32	15.04	15.18	10.06	9.27	14.46	7.84
CaO	11.48	11.59	11.66	11.26	11.44	11.59	11.59	11.37	11.47	11.53	11.43	11.28	11.32
Na_2O	0.64	0.49	0.80	1.52	1.15	0.88	0.72	0.55	0.60	1.61	1.67	0.67	1.76
K_2O	0.27	0.19	0.42	1.39	0.52	0.33	0.27	0.13	0.18	1.01	1.21	0.19	1.17
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.02	*n.d.*	0.02	0.05	0.03	0.01	0.03	0.01	0.01	0.02	0.01	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.85	97.57	97.87	97.75	98.39	99.05	98.89	98.25	97.43	97.65	97.88	98.27	97.83
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	7.38	7.49	7.19	6.21	6.88	7.17	7.32	7.54	7.44	6.32	6.24	7.59	6.20
Ti	0.04	0.04	0.05	0.10	0.08	0.05	0.06	0.05	0.04	0.12	0.11	0.03	0.14
Al	0.79	0.65	1.10	2.49	1.52	1.10	0.89	0.66	0.69	2.33	2.42	0.80	2.53
Fe^{2+}	1.66	1.51	1.71	2.07	1.61	1.48	1.47	1.51	1.14	1.75	1.62	1.54	2.18
Mn	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Mg	2.89	2.94	2.70	1.81	2.62	2.89	3.06	3.21	3.25	2.23	2.05	3.08	1.77
Ca	1.79	1.80	1.83	1.82	1.79	1.78	1.78	1.75	1.76	1.84	1.82	1.73	1.83
Na	0.18	0.14	0.23	0.45	0.32	0.24	0.20	0.15	0.17	0.46	0.48	0.19	0.52
K	0.05	0.04	0.08	0.27	0.10	0.06	0.05	0.02	0.03	0.19	0.23	0.03	0.23
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.33	0.40	0.29	0.37	0.36	0.39	0.31	0.17	0.48	0.30	0.53	0.05	0.24
Zn	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.14	15.04	15.21	15.62	15.31	15.19	15.15	15.09	15.03	15.57	15.53	15.06	15.65

Mineral							Amphibole						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Hbl2 2	Hbl2 3	Hbl2 4	Hbl3 1	Hbl3 2	Hbl3 3	Hbl3 4	Hbl3 5	Hbl3 6	Hbl3 7	Hbl3 8	Hbl4 1	Hbl4 2
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	41.43	39.94	43.03	48.98	42.33	41.35	40.36	50.09	43.21	45.94	43.43	44.45	47.72
TiO_2	1.73	1.44	1.19	0.62	1.39	1.25	0.78	0.49	0.74	0.75	0.61	0.60	0.84
Al_2O_3	13.54	14.89	12.03	6.54	12.08	13.07	13.91	5.10	13.47	9.17	11.73	10.74	7.66
FeO (total)	19.77	19.44	18.71	17.27	20.06	19.49	20.71	18.00	23.20	18.33	19.12	18.93	18.12
MnO	0.13	0.15	0.17	0.14	0.13	0.12	0.12	0.18	0.90	0.15	0.12	0.13	0.12
MgO	8.17	7.55	9.03	12.40	8.71	8.24	8.05	13.28	7.93	10.71	9.32	9.62	11.51
CaO	11.03	11.14	11.19	11.24	11.33	11.31	11.22	10.05	9.59	11.23	11.30	11.03	10.95
Na_2O	1.73	1.82	1.63	0.99	1.62	1.85	1.75	0.72	0.85	1.30	1.46	1.45	1.13
K_2O	1.16	1.37	0.94	0.34	1.05	0.95	1.29	0.25	0.43	0.57	0.79	0.77	0.48
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.d.*	0.01	0.03	0.05	0.03	0.05	0.03	0.03	0.01	*n.d.*	0.01	0.04	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.70	97.75	97.96	98.57	98.73	97.68	98.22	98.18	100.33	98.15	97.89	97.76	98.55
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.20	6.06	6.45	7.12	6.33	6.26	6.09	7.30	6.31	6.78	6.48	6.63	6.98
Ti	0.19	0.16	0.13	0.07	0.16	0.14	0.09	0.05	0.08	0.08	0.07	0.07	0.09
Al	2.39	2.66	2.12	1.12	2.13	2.33	2.47	0.88	2.32	1.60	2.06	1.89	1.32
Fe^{2+}	2.13	2.18	2.05	1.67	2.08	2.15	1.99	1.82	2.01	1.84	1.92	1.96	1.78
Mn	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.11	0.02	0.01	0.02	0.01
Mg	1.82	1.71	2.02	2.69	1.94	1.86	1.81	2.88	1.73	2.36	2.07	2.14	2.51
Ca	1.77	1.81	1.80	1.75	1.82	1.83	1.81	1.57	1.50	1.78	1.81	1.76	1.72
Na	0.50	0.54	0.47	0.28	0.47	0.54	0.51	0.20	0.24	0.37	0.42	0.42	0.32
K	0.22	0.27	0.18	0.06	0.20	0.18	0.25	0.05	0.08	0.11	0.15	0.15	0.09
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.34	0.28	0.29	0.43	0.42	0.32	0.62	0.37	0.82	0.43	0.47	0.40	0.43
Zn	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.60	15.70	15.54	15.21	15.57	15.64	15.66	15.15	15.20	15.36	15.47	15.44	15.26

Mineral							Amphibole						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Hbl4 3	Hbl4 4	Hbl4 5	Hbl4 6	Hbl4 7	Hbl4 8	Hbl4 9	Hbl4 11	Hbl5 1	Hbl5 2	Hbl5 3	Hbl5 4	Hbl5 5
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	48.34	53.36	50.50	51.49	51.51	50.91	49.32	41.02	42.25	49.80	44.10	42.25	40.68
TiO_2	0.72	0.22	0.56	0.42	0.35	0.41	0.62	1.28	1.12	0.50	0.99	1.33	0.81
Al_2O_3	6.59	1.33	5.15	3.66	4.10	5.11	6.52	13.23	12.74	5.79	10.65	12.43	15.00
FeO (total)	18.05	26.07	16.48	20.83	16.70	16.23	17.56	20.27	19.55	16.78	18.71	19.02	19.29
MnO	0.14	0.35	0.16	0.23	0.14	0.13	0.13	0.09	0.15	0.14	0.17	0.15	0.12
MgO	12.18	14.96	13.20	13.74	13.93	13.45	12.24	8.19	8.57	12.93	10.03	8.92	7.86
CaO	10.62	2.50	11.39	7.65	10.87	11.13	11.14	11.19	11.13	11.22	11.20	11.30	11.41
Na_2O	0.93	0.16	0.75	0.49	0.63	0.74	0.97	1.89	1.73	0.83	1.55	1.68	1.70
K_2O	0.38	0.08	0.23	0.19	0.18	0.21	0.39	1.10	0.97	0.29	0.81	1.12	1.29
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.03	0.05	0.01	0.02	0.04	*n.d.*	0.03	0.07	0.05	0.03	0.03	0.01	0.06
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.98	99.08	98.42	98.72	98.45	98.31	98.91	98.34	98.26	98.31	98.23	98.22	98.22
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	7.09	7.82	7.27	7.51	7.45	7.37	7.15	6.18	6.33	7.23	6.55	6.34	6.12
Ti	0.08	0.02	0.06	0.05	0.04	0.04	0.07	0.15	0.13	0.06	0.11	0.15	0.09
Al	1.14	0.23	0.87	0.63	0.70	0.87	1.11	2.35	2.25	0.99	1.87	2.20	2.66
Fe^{2+}	1.76	3.13	1.34	2.31	1.72	1.69	1.75	2.12	2.08	1.66	1.89	2.07	2.07
Mn	0.02	0.04	0.02	0.03	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02
Mg	2.66	3.27	2.83	2.99	3.00	2.90	2.65	1.84	1.91	2.80	2.22	1.99	1.76
Ca	1.67	0.39	1.76	1.19	1.68	1.73	1.73	1.81	1.79	1.75	1.78	1.82	1.84
Na	0.27	0.04	0.21	0.14	0.18	0.21	0.27	0.55	0.50	0.23	0.45	0.49	0.50
K	0.07	0.01	0.04	0.03	0.03	0.04	0.07	0.21	0.19	0.05	0.15	0.21	0.25
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.46	0.07	0.64	0.23	0.30	0.27	0.38	0.44	0.37	0.38	0.44	0.32	0.36
Zn	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.20	15.04	15.04	15.10	15.12	15.14	15.21	15.66	15.58	15.17	15.48	15.61	15.66

Mineral							Amphibole						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Hbl8 1	Hbl8 2	Hbl8 3	Hbl8 4	Hbl8 5	Hbl8 6	Hbl8 7	Hbl8 8	Hbl9 1	Hbl9 2	Hbl9 3	Hbl9 4	Hbl9 5
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	44.00	50.80	52.79	51.59	52.59	51.26	51.33	44.14	42.88	46.07	45.53	52.65	48.14
TiO_2	1.04	0.47	0.28	0.49	0.30	0.41	0.41	0.72	0.72	0.57	0.89	0.17	0.70
Al_2O_3	11.89	5.91	3.73	4.40	3.71	5.12	5.18	11.84	12.40	9.65	9.55	1.66	7.25
FeO (total)	17.22	14.54	13.46	14.01	13.51	14.08	14.13	16.92	19.81	18.66	18.93	26.36	18.51
MnO	0.20	0.21	0.22	0.19	0.20	0.22	0.23	0.19	0.10	0.08	0.09	0.30	0.11
MgO	10.41	14.12	15.48	14.87	15.48	14.36	14.70	10.66	8.81	10.33	10.19	14.58	11.61
CaO	11.45	11.46	11.50	11.48	11.63	11.62	11.68	11.46	11.17	11.28	11.34	2.52	10.74
Na_2O	1.55	0.86	0.50	0.59	0.48	0.73	0.71	1.53	1.62	1.33	1.39	0.23	1.03
K_2O	0.87	0.26	0.16	0.16	0.14	0.26	0.20	0.83	0.92	0.61	0.65	0.09	0.36
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.d.*	*n.d.*	0.03	0.01	0.01	0.03	0.01	0.03	0.02	0.04	0.03	0.05	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.63	98.63	98.16	97.80	98.05	98.08	98.58	98.32	98.45	98.61	98.58	98.61	98.45
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.48	7.28	7.56	7.39	7.54	7.38	7.34	6.50	6.40	6.78	6.73	7.76	7.04
Ti	0.11	0.05	0.03	0.05	0.03	0.04	0.04	0.08	0.08	0.06	0.10	0.02	0.08
Al	2.06	1.00	0.63	0.74	0.63	0.87	0.87	2.06	2.18	1.67	1.66	0.29	1.25
Fe^{2+}	1.78	1.43	1.44	1.18	1.41	1.44	1.37	1.69	2.02	1.93	1.97	3.12	1.82
Mn	0.03	0.03	0.03	0.02	0.02	0.03	0.03	0.02	0.01	0.01	0.01	0.04	0.01
Mg	2.29	3.02	3.30	3.18	3.31	3.08	3.13	2.34	1.96	2.27	2.25	3.20	2.53
Ca	1.81	1.76	1.76	1.76	1.79	1.79	1.79	1.81	1.79	1.78	1.80	0.40	1.68
Na	0.44	0.24	0.14	0.17	0.13	0.20	0.20	0.44	0.47	0.38	0.40	0.07	0.29
K	0.16	0.05	0.03	0.03	0.03	0.05	0.04	0.16	0.17	0.11	0.12	0.02	0.07
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.35	0.31	0.17	0.50	0.21	0.25	0.32	0.39	0.45	0.37	0.37	0.13	0.45
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.50	15.16	15.10	15.03	15.09	15.14	15.14	15.49	15.53	15.38	15.41	15.05	15.21

Mineral							Amphibole						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Hbl9 6	Hbl9 7	Hbl10 1	Hbl10 2	Hbl10 3	Hbl10 4	Hbl10 5	Hbl10 6	Hbl10 7	Hbl10 8	Hbl11 1	Hbl11 2	Hbl11 3
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	46.13	42.79	43.96	49.76	43.47	49.16	50.81	51.47	48.73	43.10	46.37	44.96	46.52
TiO_2	0.60	0.73	0.85	0.50	1.00	0.49	0.54	0.49	0.56	0.85	1.13	1.31	1.32
Al_2O_3	9.61	12.74	11.34	5.80	12.02	6.56	5.10	4.51	7.08	12.38	9.34	10.05	8.69
FeO (total)	18.91	19.64	17.94	16.48	18.43	16.18	15.64	14.88	16.27	18.40	16.89	16.93	16.45
MnO	0.08	0.09	0.17	0.18	0.17	0.15	0.18	0.18	0.20	0.17	0.20	0.20	0.20
MgO	10.38	8.61	10.09	13.05	9.47	13.02	13.83	14.23	12.48	9.36	11.50	10.88	12.06
CaO	11.08	11.12	11.22	11.08	11.25	11.45	11.37	11.46	11.35	11.39	11.28	11.32	11.22
Na_2O	1.29	1.61	1.57	0.77	1.65	0.98	0.76	0.65	1.05	1.64	1.33	1.49	1.25
K_2O	0.59	0.96	0.73	0.24	0.84	0.35	0.27	0.17	0.35	0.86	0.58	0.68	0.57
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.04	0.04	*n.d.*	*n.d.*	*n.d.*	0.03	0.02	0.03	*n.d.*	0.01	0.04	0.01	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.72	98.33	97.87	97.87	98.31	98.38	98.52	98.07	98.07	98.16	98.65	97.83	98.31
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.78	6.39	6.53	7.25	6.42	7.13	7.28	7.43	7.10	6.42	6.78	6.66	6.80
Ti	0.07	0.08	0.10	0.05	0.11	0.05	0.06	0.05	0.06	0.10	0.12	0.15	0.15
Al	1.66	2.24	1.99	1.00	2.09	1.12	0.86	0.77	1.22	2.17	1.61	1.76	1.50
Fe^{2+}	1.88	2.06	1.84	1.66	1.61	1.56	1.24	1.56	1.65	1.94	1.71	1.80	1.61
Mn	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
Mg	2.27	1.92	2.24	2.83	2.08	2.81	2.95	3.06	2.71	2.08	2.51	2.40	2.63
Ca	1.74	1.78	1.79	1.73	1.78	1.78	1.74	1.77	1.77	1.82	1.77	1.80	1.76
Na	0.37	0.47	0.45	0.22	0.47	0.28	0.21	0.18	0.30	0.47	0.38	0.43	0.36
K	0.11	0.18	0.14	0.05	0.16	0.06	0.05	0.03	0.06	0.16	0.11	0.13	0.11
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.44	0.39	0.39	0.35	0.66	0.41	0.63	0.24	0.33	0.35	0.35	0.29	0.40
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.34	15.53	15.48	15.16	15.41	15.22	15.05	15.12	15.24	15.54	15.36	15.45	15.33

Mineral							Amphibole						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Hbl11 4	Hbl11 5	Hbl12 1	Hbl12 2	Hbl12 3	Hbl12 4	Hbl12 5	Hbl12 6	Hbl12 7	Hbl13 1	Hbl13 2	Hbl13 3	Hbl13 4
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	45.38	41.52	44.55	47.38	48.63	51.39	49.87	52.33	41.94	41.72	40.71	44.40	40.47
TiO_2	1.40	1.68	1.11	0.71	0.61	0.44	0.63	0.25	0.81	1.30	1.38	0.83	1.23
Al_2O_3	9.91	13.33	11.18	8.75	6.60	4.65	5.98	3.27	13.95	12.92	13.83	10.25	13.82
FeO (total)	17.05	18.67	17.30	16.65	15.95	15.00	15.54	18.25	18.08	19.15	19.66	18.74	19.78
MnO	0.17	0.20	0.18	0.20	0.23	0.22	0.21	0.39	0.19	0.08	0.10	0.09	0.09
MgO	11.33	8.90	10.04	11.73	13.24	14.37	13.31	15.28	9.12	8.73	8.07	10.20	8.02
CaO	11.25	11.40	11.65	11.21	11.22	11.19	11.45	8.21	11.34	11.38	11.35	11.26	11.33
Na_2O	1.36	1.75	1.44	1.14	0.94	0.62	0.94	0.47	1.76	1.79	1.79	1.50	1.66
K_2O	0.67	1.09	0.71	0.48	0.34	0.18	0.29	0.15	1.05	1.11	1.33	0.68	1.44
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.02	0.01	0.03	0.03	*n.d.*	0.06	0.02	0.04	*n.d.*	0.04	0.01	0.06	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.54	98.55	98.19	98.28	97.76	98.12	98.24	98.64	98.24	98.21	98.24	98.01	97.86
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.65	6.20	6.60	6.92	7.08	7.37	7.23	7.55	6.25	6.27	6.15	6.60	6.13
Ti	0.15	0.19	0.12	0.08	0.07	0.05	0.07	0.03	0.09	0.15	0.16	0.09	0.14
Al	1.71	2.35	1.95	1.51	1.13	0.79	1.02	0.56	2.45	2.29	2.46	1.80	2.47
Fe^{2+}	1.68	1.99	1.93	1.67	1.43	1.28	1.56	1.93	1.88	2.08	2.15	1.85	2.12
Mn	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.05	0.02	0.01	0.01	0.01	0.01
Mg	2.48	1.98	2.22	2.55	2.87	3.07	2.87	3.28	2.03	1.96	1.82	2.26	1.81
Ca	1.77	1.82	1.85	1.75	1.75	1.72	1.78	1.27	1.81	1.83	1.84	1.79	1.84
Na	0.39	0.51	0.41	0.32	0.26	0.17	0.26	0.13	0.51	0.52	0.52	0.43	0.49
K	0.12	0.21	0.14	0.09	0.06	0.03	0.05	0.03	0.20	0.21	0.26	0.13	0.28
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.41	0.34	0.21	0.36	0.51	0.52	0.32	0.27	0.37	0.33	0.33	0.48	0.39
Zn	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.39	15.62	15.47	15.28	15.20	15.03	15.19	15.09	15.61	15.64	15.69	15.45	15.68

Mineral							Amphibole						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01B	PNF 01B	PNF 01B	PNF 01B
Anl code	Hbl13 5	Hbl13 6	Hbl13 7	Hbl13 8	Hbl13 9	Hbl14 1	Hbl14 2	Hbl14 3	Hbl14 4	hbl_1.1	hbl_1.2	hbl_1.3	hbl_1.4
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Amphibolite	Amphibolite	Amphibolite	Amphibolite
SiO_2	42.04	40.42	49.93	41.34	41.19	49.86	45.27	49.80	46.00	41.82	43.11	43.39	44.36
TiO_2	1.23	1.09	0.36	0.94	1.25	0.49	0.59	0.38	0.64	0.67	0.55	0.54	0.52
Al_2O_3	12.87	13.90	4.87	14.22	13.43	6.45	11.08	6.57	10.12	13.61	11.71	11.50	10.74
FeO (total)	19.58	19.99	21.06	19.50	19.30	15.69	16.71	15.08	16.49	17.28	16.79	16.44	16.09
MnO	0.11	0.07	0.19	0.09	0.10	0.15	0.16	0.18	0.15	0.25	0.28	0.27	0.29
MgO	8.68	8.03	13.29	8.21	8.29	13.39	10.81	13.60	11.40	9.96	11.09	11.22	11.37
CaO	11.42	11.31	7.57	11.16	11.38	11.31	11.31	11.40	11.45	11.98	12.02	12.03	12.46
Na_2O	1.75	1.73	0.68	1.83	1.75	0.87	1.46	0.93	1.40	1.08	1.07	1.04	0.93
K_2O	1.10	1.42	0.28	1.06	1.29	0.32	0.79	0.32	0.60	1.01	0.77	0.75	0.76
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.01	0.02	0.08	0.08
ZnO	0.03	0.04	0.09	0.02	0.04	0.06	*n.d.*	0.02	0.02	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.80	98.00	98.31	98.37	98.02	98.59	98.18	98.28	98.26	97.65	97.41	97.26	97.58
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.28	6.12	7.32	6.19	6.22	7.13	6.66	7.12	6.74	6.21	6.38	6.42	6.55
Ti	0.14	0.12	0.04	0.11	0.14	0.05	0.07	0.04	0.07	0.07	0.06	0.06	0.06
Al	2.27	2.48	0.84	2.51	2.39	1.09	1.92	1.11	1.75	2.38	2.04	2.01	1.87
Fe^{2+}	2.08	2.10	2.19	2.06	2.15	1.15	1.75	1.05	1.69	1.49	1.35	1.36	1.46
Mn	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.04
Mg	1.93	1.81	2.90	1.83	1.87	2.85	2.37	2.90	2.49	2.20	2.45	2.48	2.50
Ca	1.83	1.83	1.19	1.79	1.84	1.73	1.78	1.75	1.80	1.90	1.91	1.91	1.97
Na	0.51	0.51	0.19	0.53	0.51	0.24	0.42	0.26	0.40	0.31	0.31	0.30	0.27
K	0.21	0.27	0.05	0.20	0.25	0.06	0.15	0.06	0.11	0.19	0.15	0.14	0.14
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Fe^{3+}	0.36	0.43	0.39	0.38	0.29	0.73	0.31	0.76	0.33	0.65	0.72	0.67	0.52
Zn	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.62	15.69	15.15	15.62	15.68	15.06	15.44	15.06	15.40	15.45	15.40	15.39	15.39

Mineral							Amphibole						
Sample	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B
Anl code	hbl_1.5	hbl_1.6	hbl_1.7	hbl_1.8	hbl_2 ln1	hbl_2 ln2	hbl_2 ln3	hbl_2 ln4	hbl_2 ln5	hbl_2 ln6	hbl_3.1	hbl_3.2	hbl_3.3
Rock type	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite
SiO_2	50.10	43.44	48.88	43.91	43.23	49.06	44.26	43.37	43.43	44.35	49.32	43.12	43.38
TiO_2	0.23	0.57	0.37	0.54	0.55	0.25	0.52	0.56	0.57	0.50	0.26	0.58	0.55
Al_2O_3	5.15	11.56	6.42	10.97	11.70	6.02	10.85	11.65	11.72	10.57	5.76	12.10	11.53
FeO (total)	13.77	16.67	14.41	16.60	16.71	14.29	16.44	16.70	16.86	16.63	14.27	17.24	16.78
MnO	0.27	0.26	0.28	0.32	0.25	0.29	0.29	0.26	0.27	0.27	0.28	0.28	0.28
MgO	15.20	10.90	14.15	11.31	10.90	14.25	11.29	11.00	10.95	11.19	14.50	10.70	11.06
CaO	12.51	12.29	12.25	12.12	11.93	12.47	12.09	11.96	12.15	12.12	12.24	12.20	12.22
Na_2O	0.48	0.98	0.61	1.00	1.01	0.53	0.92	1.06	0.94	0.87	0.55	1.08	0.99
K_2O	0.22	0.78	0.29	0.70	0.80	0.25	0.67	0.78	0.82	0.63	0.26	0.86	0.80
Cr_2O_3	0.08	0.07	0.22	0.09	0.06	0.21	0.31	0.32	0.20	0.13	0.02	0.04	0.04
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.02	97.51	97.88	97.55	97.15	97.61	97.64	97.66	97.90	97.26	97.45	98.20	97.63
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	7.19	6.43	7.07	6.48	6.42	7.11	6.52	6.40	6.40	6.56	7.14	6.35	6.41
Ti	0.03	0.06	0.04	0.06	0.06	0.03	0.06	0.06	0.06	0.06	0.03	0.06	0.06
Al	0.87	2.02	1.09	1.91	2.05	1.03	1.88	2.03	2.04	1.84	0.98	2.10	2.01
Fe^{2+}	1.06	1.45	1.19	1.38	1.41	1.18	1.40	1.40	1.40	1.44	1.15	1.46	1.39
Mn	0.03	0.03	0.03	0.04	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.04
Mg	3.25	2.41	3.05	2.49	2.41	3.08	2.48	2.42	2.41	2.47	3.13	2.35	2.44
Ca	1.92	1.95	1.90	1.92	1.90	1.94	1.91	1.89	1.92	1.92	1.90	1.93	1.93
Na	0.13	0.28	0.17	0.29	0.29	0.15	0.26	0.30	0.27	0.25	0.15	0.31	0.28
K	0.04	0.15	0.05	0.13	0.15	0.05	0.13	0.15	0.15	0.12	0.05	0.16	0.15
Cr	0.01	0.01	0.02	0.01	0.01	0.02	0.04	0.04	0.02	0.02	0.00	0.01	0.00
Fe^{3+}	0.59	0.61	0.56	0.67	0.66	0.55	0.63	0.66	0.68	0.62	0.58	0.67	0.68
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.13	15.40	15.17	15.37	15.39	15.16	15.34	15.39	15.38	15.33	15.15	15.43	15.40

Mineral							Amphibole						
Sample	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B
Anl code	hbl_3.4	hbl_3.5	hbl_3.6	hbl_3.7	hbl_3.8	hbl_3.9	hbl_4.1	hbl_4.2	hbl_4.3	hbl_5.1	hbl_5.2	hbl_5.3	hbl_5.4
Rock type	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite
SiO_2	43.56	49.26	42.85	43.45	48.27	43.13	43.54	44.40	43.52	49.24	43.06	42.56	48.00
TiO_2	0.55	0.25	0.59	0.56	0.32	0.56	0.58	0.54	0.55	0.30	0.57	0.60	0.32
Al_2O_3	11.16	5.70	11.96	11.95	7.04	11.73	11.71	10.63	11.34	5.29	11.67	12.13	6.81
FeO (total)	16.38	14.04	17.06	16.98	14.48	16.86	16.67	16.12	16.39	13.85	16.74	17.21	14.40
MnO	0.25	0.28	0.32	0.28	0.28	0.26	0.28	0.27	0.26	0.29	0.26	0.31	0.29
MgO	11.00	14.75	11.01	10.74	13.92	10.88	10.82	11.35	11.11	14.96	10.89	10.68	13.84
CaO	12.15	12.37	12.12	12.05	12.27	12.21	12.27	12.30	12.08	12.26	12.31	12.10	12.55
Na_2O	0.88	0.52	1.06	1.01	0.64	0.98	1.04	0.88	0.95	0.52	0.99	1.03	0.60
K_2O	0.71	0.26	0.78	0.86	0.33	0.81	0.81	0.63	0.67	0.22	0.80	0.87	0.31
Cr_2O_3	0.04	0.01	0.04	0.03	0.19	0.28	0.04	0.24	0.26	0.14	0.07	0.16	0.07
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	96.67	97.43	97.79	97.90	97.73	97.71	97.76	97.35	97.13	97.07	97.35	97.66	97.19
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.49	7.13	6.32	6.41	6.99	6.38	6.44	6.56	6.45	7.14	6.39	6.30	7.00
Ti	0.06	0.03	0.07	0.06	0.03	0.06	0.06	0.06	0.06	0.03	0.06	0.07	0.03
Al	1.96	0.97	2.08	2.08	1.20	2.04	2.04	1.85	1.98	0.90	2.04	2.12	1.17
Fe^{2+}	1.42	1.08	1.33	1.47	1.17	1.40	1.50	1.43	1.37	1.03	1.42	1.39	1.19
Mn	0.03	0.03	0.04	0.03	0.03	0.03	0.04	0.03	0.03	0.04	0.03	0.04	0.04
Mg	2.44	3.18	2.42	2.36	3.01	2.40	2.38	2.50	2.45	3.24	2.41	2.36	3.01
Ca	1.94	1.92	1.92	1.90	1.90	1.93	1.94	1.95	1.92	1.90	1.96	1.92	1.96
Na	0.25	0.15	0.30	0.29	0.18	0.28	0.30	0.25	0.27	0.15	0.28	0.30	0.17
K	0.13	0.05	0.15	0.16	0.06	0.15	0.15	0.12	0.13	0.04	0.15	0.16	0.06
Cr	0.00	0.00	0.00	0.00	0.02	0.03	0.00	0.03	0.03	0.02	0.01	0.02	0.01
Fe^{3+}	0.62	0.62	0.78	0.63	0.59	0.68	0.56	0.56	0.66	0.65	0.66	0.75	0.56
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.36	15.15	15.40	15.40	15.19	15.40	15.42	15.34	15.36	15.14	15.41	15.42	15.21

Mineral	Amphibole				Plagioclase								
Sample	PNF 01B	PNF 01B	PNF 01B	PNF 01B	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	hbl_5.5	hbl_5.6	hbl_5.7	hbl_5.8	Plg n3 c1	Plg n3 b1	Plg n3 b2	Plg f3.1	Plg f3.2	Plg n2 c1	Plg n2 c2	Plg n2 b1	Plg n3 c1
Rock type	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	42.85	48.08	44.56	44.95	54.36	54.49	55.97	63.10	58.89	54.17	54.28	64.50	53.01
TiO_2	0.62	0.27	0.50	0.50	0.05	0.08	*n.d.*	0.02	0.03	0.04	0.12	*n.d.*	0.03
Al_2O_3	12.39	6.47	10.37	12.49	29.06	29.06	28.19	23.24	26.30	28.91	29.40	22.39	30.47
FeO (total)	17.12	14.48	16.31	15.17	0.24	0.13	0.06	0.08	0.07	0.40	0.20	0.10	0.08
MnO	0.29	0.28	0.30	0.27	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	0.03	*n.d.*	*n.d.*
MgO	10.49	14.29	11.77	10.30	0.09	*n.d.*	*n.d.*	*n.d.*	0.01	0.09	0.02	*n.d.*	*n.d.*
CaO	12.15	12.41	12.15	11.74	10.03	10.11	9.11	3.98	7.11	11.19	11.24	3.26	12.49
Na_2O	1.07	0.60	0.93	1.50	5.00	5.09	5.77	9.03	6.90	4.92	5.01	9.58	4.27
K_2O	0.89	0.27	0.63	0.71	0.18	0.11	0.17	0.28	0.18	0.14	0.11	0.32	0.10
Cr_2O_3	0.13	0.09	0.09	0.06	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.03	0.03	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.11	0.09	0.10	0.09	0.10	0.04	0.12	*n.d.*	0.04
Total	97.98	97.22	97.61	97.69	99.15	99.20	99.27	99.73	99.50	99.86	100.40	100.15	100.45
Oxygens	23.00	23.00	23.00	23.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	6.33	6.99	6.55	6.63	2.47	2.47	2.53	2.80	2.64	2.45	2.44	2.84	2.39
Ti	0.07	0.03	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	2.16	1.11	1.80	2.17	1.56	1.55	1.50	1.21	1.39	1.54	1.56	1.16	1.62
Fe^{2+}	1.48	1.07	1.32	1.77	0.01	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00
Mn	0.04	0.03	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	2.31	3.10	2.58	2.27	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Ca	1.92	1.93	1.91	1.86	0.49	0.49	0.44	0.19	0.34	0.54	0.54	0.15	0.60
Na	0.31	0.17	0.27	0.43	0.44	0.45	0.50	0.78	0.60	0.43	0.44	0.82	0.37
K	0.17	0.05	0.12	0.13	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01
Cr	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.63	0.70	0.68	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.43	15.18	15.34	15.46	4.98	4.98	4.99	5.00	4.98	5.00	5.00	5.00	5.00

Mineral							Plagioclase						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Plg n3 c2	Plg f3.1	Plg f3.2	Plg n3.2 c2	Plg n3.2 c1	Plg n4.2 c1	Plg n4.2 b1	Plg n4.3 c1	Plg n4.3 c2	Plg n4.3 b1	Plg n8.1 c1	Plg n8.1 c2	Plg n8.1 b1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	53.11	58.99	58.83	54.65	53.35	53.17	66.78	53.86	55.51	64.15	52.82	54.80	59.98
TiO_2	0.02	*n.d.*	*n.d.*	0.05	0.09	0.10	*n.d.*	0.07	0.03	0.04	*n.d.*	*n.d.*	*n.d.*
Al_2O_3	30.06	26.08	26.61	28.74	29.66	29.84	21.35	29.82	28.50	23.26	30.07	29.06	25.69
FeO (total)	0.41	0.07	0.10	0.29	0.51	0.65	0.26	0.30	0.31	0.05	0.14	0.12	0.04
MnO	*n.d.*	0.02	*n.d.*	0.01	0.01	0.03	0.02	*n.d.*	0.02	0.02	*n.d.*	*n.d.*	*n.d.*
MgO	0.09	*n.d.*	*n.d.*	0.04	0.09	0.15	0.06	0.03	0.03	*n.d.*	0.01	*n.d.*	*n.d.*
CaO	12.19	7.49	7.93	10.64	11.81	12.04	4.17	11.77	10.27	4.15	12.26	10.88	6.93
Na_2O	4.38	7.06	6.97	5.30	4.58	4.59	8.13	4.70	5.49	9.12	4.37	5.27	7.44
K_2O	0.12	0.26	0.19	0.14	0.16	0.15	0.31	0.15	0.18	0.28	0.12	0.14	0.23
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.06	*n.d.*	*n.d.*	0.03	0.02	0.08	0.09	0.03	*n.d.*	0.08	0.08	*n.d.*	0.05
SrO	0.08	0.12	0.04	0.08	0.11	0.04	0.04	0.12	0.06	0.09	0.08	0.11	0.08
Total	100.39	99.97	100.63	99.86	100.25	100.72	101.08	100.69	100.34	101.06	99.80	100.27	100.31
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.40	2.63	2.61	2.47	2.41	2.40	2.90	2.42	2.49	2.81	2.40	2.46	2.66
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.60	1.37	1.39	1.53	1.58	1.59	1.09	1.58	1.51	1.20	1.61	1.54	1.34
Fe^{2+}	0.02	0.00	0.00	0.01	0.02	0.02	0.01	0.01	0.01	0.00	0.01	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.59	0.36	0.38	0.52	0.57	0.58	0.19	0.57	0.49	0.19	0.60	0.52	0.33
Na	0.38	0.61	0.60	0.46	0.40	0.40	0.68	0.41	0.48	0.77	0.38	0.46	0.64
K	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	5.01	5.01	5.02	4.91	5.00	5.00	4.99	5.00	5.00	5.00

Mineral							Plagioclase						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Plg n8.2 c1	Plg n8.2 b1	Plg n9.1 b1	Plg n9.1 c1	Plg n9.1 c2	Plg n9.1 c3	Plg n9.1 c4	Plg n9.1 b2	Plg n9.1 b3	Plg2 b1	Plg2 c1	Plg2 c2	Plg2 b2
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	53.67	59.74	54.48	56.75	55.79	50.71	55.61	53.06	55.54	55.21	54.26	52.80	61.86
TiO_2	0.03	*n.d.*	0.09	0.12	0.10	*n.d.*	0.13	0.06	0.13	0.10	0.03	0.02	*n.d.*
Al_2O_3	29.92	25.75	28.90	27.27	27.99	31.52	27.96	30.04	27.92	28.40	29.23	29.90	24.32
FeO (total)	0.12	0.18	0.24	0.49	0.13	0.23	0.41	0.23	0.35	0.50	0.19	0.52	0.12
MnO	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	0.03	0.03	0.01	*n.d.*	0.01	*n.d.*	0.01
MgO	0.03	0.02	0.04	0.20	*n.d.*	*n.d.*	0.11	0.08	0.04	0.09	0.02	0.09	*n.d.*
CaO	11.90	7.06	10.71	8.86	9.81	13.80	9.85	11.95	9.73	10.32	11.27	12.26	5.59
Na_2O	4.71	7.36	5.19	6.08	5.81	3.50	5.73	4.53	5.77	5.50	5.04	4.41	8.35
K_2O	0.12	0.23	0.18	0.33	0.21	0.08	0.28	0.22	0.17	0.13	0.10	0.14	0.22
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.09	*n.d.*	0.14	0.11	0.01	0.04	0.08	*n.d.*	0.05	*n.d.*	0.02	0.04
SrO	0.03	0.05	0.08	0.06	0.06	0.07	0.09	0.09	0.11	0.12	0.06	0.08	0.12
Total	100.50	100.34	99.86	100.10	99.83	99.84	100.11	100.22	99.66	100.25	100.15	100.13	100.47
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.42	2.66	2.46	2.55	2.51	2.31	2.50	2.40	2.51	2.48	2.45	2.39	2.73
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.59	1.35	1.54	1.44	1.49	1.69	1.48	1.60	1.49	1.51	1.55	1.60	1.27
Fe^{2+}	0.00	0.01	0.01	0.02	0.00	0.01	0.02	0.01	0.01	0.02	0.01	0.02	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.00
Ca	0.57	0.34	0.52	0.43	0.47	0.67	0.48	0.58	0.47	0.50	0.54	0.60	0.26
Na	0.41	0.63	0.45	0.53	0.51	0.31	0.50	0.40	0.51	0.48	0.44	0.39	0.72
K	0.01	0.01	0.01	0.02	0.01	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	5.01	5.00	5.00	5.01	5.01	5.01	5.01	5.00	5.01	5.00

Mineral							Plagioclase						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 XII 8B
Anl code	Plg4 b1	Plg4 c1	Plg4 b2	Plg4 b3	Plg5 b1	Plg5 c1	Plg5 c2	Plg5 c3	Plg5 b2	Plg5 b3	Plg icl1	Plg icl2	Plg n1.1 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Fol metgb
SiO_2	57.07	52.18	54.21	60.27	57.37	52.64	51.98	53.08	57.07	62.37	56.29	57.55	53.02
TiO_2	0.05	0.11	0.07	0.07	0.03	0.06	0.07	0.05	*n.d.*	0.08	0.07	0.16	0.07
Al_2O_3	27.59	30.44	29.36	24.77	27.32	29.92	30.96	30.06	27.32	23.91	27.99	27.14	30.00
FeO (total)	0.21	0.43	0.39	0.77	0.17	0.65	0.13	0.35	0.31	0.23	0.56	0.39	0.13
MnO	0.02	0.03	*n.d.*	0.01	0.01	0.01	*n.d.*	*n.d.*	0.01	0.01	*n.d.*	*n.d.*	*n.d.*
MgO	0.01	0.07	0.08	0.06	*n.d.*	0.18	*n.d.*	0.05	0.06	*n.d.*	0.04	*n.d.*	0.01
CaO	9.26	12.89	11.23	6.18	8.83	12.40	13.10	12.17	9.24	4.98	9.45	8.86	12.15
Na_2O	6.18	4.14	5.07	7.75	6.33	4.25	3.98	4.52	6.18	8.62	5.88	6.39	4.43
K_2O	0.14	0.11	0.13	0.25	0.17	0.15	0.09	0.13	0.16	0.23	0.17	0.14	0.12
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	*n.d.*	*n.d.*	0.10	*n.d.*	0.04	0.03	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	0.06
SrO	0.14	0.13	0.14	0.12	0.08	0.12	0.06	0.07	0.12	0.09	0.13	0.16	0.09
Total	100.54	100.39	100.53	100.13	100.23	100.27	100.31	100.41	100.35	100.43	100.46	100.63	99.93
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.55	2.36	2.44	2.69	2.57	2.39	2.35	2.40	2.55	2.76	2.52	2.57	2.40
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Al	1.45	1.62	1.56	1.30	1.44	1.60	1.65	1.60	1.44	1.24	1.48	1.43	1.60
Fe^{2+}	0.01	0.02	0.01	0.03	0.01	0.02	0.00	0.01	0.01	0.01	0.02	0.01	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.44	0.63	0.54	0.30	0.42	0.60	0.64	0.59	0.44	0.24	0.45	0.42	0.59
Na	0.53	0.36	0.44	0.67	0.55	0.37	0.35	0.40	0.54	0.74	0.51	0.55	0.39
K	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.01	5.01	5.01	5.00	5.01	5.00	5.01	5.00	5.00	5.00	5.00	5.00

Mineral							Plagioclase						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Plg n1.1 c2	Plg n1.1 b1	Plg f1.1 c1	Plg f1.2 c1	Plg f1.3 c1	Plg f1.4 c1	Plg icl2.2 c1	Plg icl2.2 c1	Plg n3.1 c1	Plg n3.1 c2	Plg n3.1 b1	Plg n4.1 c1	Plg n4.1 c2
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	52.13	54.32	61.34	61.27	54.52	61.17	52.09	56.02	54.65	58.02	53.30	54.23	53.68
TiO_2	0.06	0.08	0.01	0.03	0.08	0.04	0.08	0.03	0.08	0.02	0.05	0.06	*n.d.*
Al_2O_3	30.53	29.25	24.66	24.27	28.63	24.41	30.35	27.82	29.05	26.69	29.57	29.29	29.90
FeO (total)	0.13	0.30	0.09	0.16	0.42	0.20	0.45	0.25	0.25	0.12	0.56	0.06	0.12
MnO	0.03	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*
MgO	0.02	0.06	*n.d.*	0.04	0.10	*n.d.*	0.01	*n.d.*	0.03	*n.d.*	0.17	*n.d.*	*n.d.*
CaO	12.74	11.10	5.83	5.33	10.72	5.74	12.47	9.79	10.97	8.33	11.94	11.46	12.04
Na_2O	4.09	4.98	8.08	8.29	5.32	8.13	4.24	5.89	5.17	6.66	4.67	4.89	4.60
K_2O	0.13	0.14	0.24	0.29	0.15	0.25	0.14	0.13	0.11	0.17	0.14	0.13	0.10
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.01	*n.d.*	0.01	0.05	0.04	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	0.02	*n.d.*	0.04
SrO	0.12	0.13	0.12	0.10	0.14	0.14	0.12	0.09	0.10	0.06	0.09	0.09	0.13
Total	99.87	100.26	100.25	99.69	99.94	99.93	99.87	99.94	100.31	100.02	100.42	100.12	100.45
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.37	2.45	2.72	2.73	2.46	2.72	2.37	2.52	2.46	2.60	2.41	2.45	2.42
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.63	1.55	1.29	1.27	1.53	1.28	1.63	1.48	1.54	1.41	1.57	1.56	1.59
Fe^{2+}	0.01	0.01	0.00	0.01	0.02	0.01	0.02	0.01	0.01	0.00	0.02	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Ca	0.62	0.54	0.28	0.25	0.52	0.27	0.61	0.47	0.53	0.40	0.58	0.55	0.58
Na	0.36	0.43	0.69	0.72	0.47	0.70	0.37	0.51	0.45	0.58	0.41	0.43	0.40
K	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	5.00	5.01	5.00	5.01	5.01	5.00	5.00	5.02	5.00	5.00

Mineral							Plagioclase						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Plg f4.1 c1	Plg f4.2 c1	Plg f4.3 c1	Plg f4.4 c1	Plg n4.2 c1	Plg n4.2 b1	Plg f4.5 c1	Plg icl5.1 c1	Plg icl5.2 c1	Plg icl5.3 b1	Plg icl5.3 c1	Plg icl6.1 c1	Plg n7.1 c1
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	56.86	61.07	60.80	58.72	54.60	53.00	59.11	58.73	52.27	59.95	55.39	58.36	51.35
TiO_2	*n.d.*	*n.d.*	0.03	*n.d.*	0.05	*n.d.*	0.03	0.02	0.07	0.02	0.10	0.05	0.10
Al_2O_3	27.63	24.61	24.82	26.16	29.20	29.86	25.78	26.19	30.63	25.49	28.58	26.49	30.82
FeO (total)	0.11	0.15	0.18	0.04	0.12	0.15	0.25	0.27	0.33	0.38	0.26	0.30	0.33
MnO	0.02	*n.d.*	0.03	*n.d.*	*n.d.*	0.02	*n.d.*	0.01	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*
MgO	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	*n.d.*	0.01	0.02	*n.d.*	*n.d.*	0.05
CaO	9.22	5.81	6.00	7.65	11.04	11.99	7.10	7.75	12.56	6.78	10.22	7.74	13.16
Na_2O	6.08	8.07	7.87	7.10	5.03	4.54	7.23	6.95	4.21	7.58	5.59	6.96	3.90
K_2O	0.17	0.25	0.25	0.19	0.15	0.12	0.22	0.19	0.10	0.22	0.11	0.17	0.10
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.03	0.04	*n.d.*	0.01	*n.d.*	*n.d.*	0.04	*n.d.*	0.05	0.07	*n.d.*	*n.d.*	*n.d.*
SrO	0.10	0.10	0.12	0.12	0.14	0.14	0.09	0.11	0.13	0.16	0.12	0.14	0.07
Total	100.09	99.97	99.97	99.86	100.19	99.73	99.71	100.11	100.17	100.44	100.27	100.06	99.81
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.55	2.72	2.70	2.63	2.46	2.41	2.65	2.62	2.37	2.66	2.49	2.61	2.34
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.46	1.29	1.30	1.38	1.55	1.60	1.36	1.38	1.63	1.33	1.51	1.40	1.66
Fe^{2+}	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.44	0.28	0.29	0.37	0.53	0.58	0.34	0.37	0.61	0.32	0.49	0.37	0.64
Na	0.53	0.70	0.68	0.62	0.44	0.40	0.63	0.60	0.37	0.65	0.49	0.60	0.34
K	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.01	5.01	5.00	5.00	5.01

Mineral							Plagioclase						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Plg n7.1 c2	Plg f7.1 c1	Plg f7.2 c1	Plg f7.3 c1	Plg f7.4 c1	Plg f7.5 c1	Plg n7.2 c1	Plg n7.2 b1	Plg1 c1	Plg1 c2	Plg1 c3	Plg1 b1	Plg2.1 b1
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	51.10	58.07	54.15	53.07	57.86	59.47	53.69	59.22	54.04	53.14	54.54	57.29	53.21
TiO_2	0.03	*n.d.*	0.06	0.04	0.01	*n.d.*	0.10	*n.d.*	0.06	0.02	0.13	*n.d.*	0.05
Al_2O_3	30.78	26.36	29.12	30.05	26.66	25.25	28.81	25.81	29.53	29.94	29.09	26.84	30.25
FeO (total)	0.64	0.04	0.11	0.07	0.01	0.20	0.27	0.15	0.32	0.30	0.37	0.64	0.37
MnO	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*
MgO	0.12	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	0.03	0.02	0.09	0.03	0.03	0.02	0.06
CaO	13.34	7.97	11.15	12.18	8.30	6.58	10.97	7.31	11.62	12.20	11.04	8.80	12.28
Na_2O	3.68	6.84	5.17	4.46	6.75	7.47	4.95	7.15	4.84	4.52	5.18	6.48	4.47
K_2O	0.12	0.18	0.11	0.12	0.19	0.21	0.18	0.20	0.12	0.07	0.11	0.07	0.10
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.02	0.04	*n.d.*	0.07	0.02	*n.d.*	*n.d.*	0.05	*n.d.*	0.03	*n.d.*	0.03
SrO	0.06	0.13	0.07	0.12	0.14	0.13	0.16	0.11	0.09	0.09	0.10	0.08	0.12
Total	99.82	99.47	99.90	100.00	99.77	99.20	99.03	99.86	100.65	100.21	100.49	100.15	100.79
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.33	2.61	2.45	2.40	2.59	2.67	2.45	2.65	2.43	2.40	2.45	2.57	2.39
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.66	1.40	1.55	1.60	1.41	1.34	1.55	1.36	1.56	1.60	1.54	1.42	1.60
Fe^{2+}	0.02	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Ca	0.65	0.38	0.54	0.59	0.40	0.32	0.54	0.35	0.56	0.59	0.53	0.42	0.59
Na	0.33	0.60	0.45	0.39	0.59	0.65	0.44	0.62	0.42	0.40	0.45	0.56	0.39
K	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.01	5.00	5.01	5.00	5.01	5.00	5.00	5.00	5.01	5.00	5.01	5.01	5.01

Mineral							Plagioclase						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01B
Anl code	Plg2.1 b2	Plg2.1 c1	Plg2.1 c2	Plg2.1 b3	Plg2.2 b1	Plg2.2 c1	Plg2.2 b2	Plg3 b1	Plg3 c1	Plg3 c2	Plg3 c3	Plg3 b2	plg_1.1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Amphibolite
SiO_2	60.35	53.13	54.24	53.48	58.00	54.94	54.71	58.75	52.90	53.35	53.63	54.71	56.84
TiO_2	0.02	0.02	0.04	0.06	0.05	0.05	0.07	0.03	0.09	0.07	0.04	0.04	*n.a.*
Al_2O_3	25.58	30.49	29.77	30.36	26.48	29.30	29.03	26.50	29.91	29.89	29.22	29.12	27.24
FeO (total)	0.27	0.13	0.28	0.18	0.72	0.27	0.38	0.15	0.71	0.21	0.63	0.22	*n.a.*
MnO	0.02	*n.d.*	0.01	0.01	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	0.01	0.02	*n.a.*
MgO	0.01	*n.d.*	0.03	*n.d.*	0.17	*n.d.*	0.04	0.02	0.19	0.06	0.17	0.02	*n.a.*
CaO	6.86	12.54	11.73	12.18	7.96	10.95	10.96	8.01	12.30	12.20	11.64	11.01	8.50
Na_2O	7.66	4.43	4.86	4.58	6.71	5.27	5.19	7.01	4.43	4.49	4.77	5.13	6.66
K_2O	0.17	0.07	0.08	0.07	0.33	0.11	0.08	0.16	0.10	0.08	0.12	0.04	0.11
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.04	0.02	*n.d.*	0.04	0.03	0.04	*n.d.*	0.02	0.03	0.02	0.01	*n.d.*	0.05
SrO	0.14	0.08	0.08	0.09	0.11	0.13	0.11	0.10	0.09	0.06	0.06	0.13	*n.a.*
Total	100.95	100.81	101.03	100.92	100.42	100.90	100.49	100.63	100.63	100.35	100.23	100.30	99.39
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.67	2.39	2.43	2.40	2.59	2.46	2.46	2.61	2.39	2.41	2.43	2.46	2.56
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.33	1.61	1.57	1.60	1.40	1.54	1.54	1.39	1.59	1.59	1.56	1.54	1.45
Fe^{2+}	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.03	0.01	0.02	0.01	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00
Ca	0.32	0.60	0.56	0.59	0.38	0.52	0.53	0.38	0.60	0.59	0.56	0.53	0.41
Na	0.66	0.39	0.42	0.40	0.58	0.46	0.45	0.60	0.39	0.39	0.42	0.45	0.58
K	0.01	0.00	0.00	0.00	0.02	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.01	5.00	5.00	5.00	5.01	5.01	5.00	5.01	5.01	5.00	5.01	5.00	4.99

Mineral							Plagioclase						
Sample	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B
Anl code	plg_1.2	plg_1.3	plg_1.4	plg_1.5	plg_1.6	plg_1.7	plg_1.8	plg_2.1	plg_2.2	plg_2.3	plg_2.4	plg_2.5	plg_2.6
Rock type	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite
SiO_2	54.85	56.69	57.06	57.12	57.46	55.61	56.60	57.04	56.96	56.34	56.86	56.74	57.14
TiO_2	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Al_2O_3	28.68	27.30	27.25	27.67	27.49	28.32	27.91	27.08	27.35	28.12	27.51	27.33	27.32
FeO (total)	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
MnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
MgO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
CaO	9.93	8.43	8.14	8.50	8.19	9.68	8.74	8.30	8.35	9.08	8.48	8.57	8.53
Na_2O	5.78	6.79	6.73	6.62	6.67	5.98	6.40	6.60	6.76	6.21	6.61	6.51	6.65
K_2O	0.10	0.13	0.12	0.10	0.15	0.09	0.15	0.11	0.09	0.14	0.11	0.12	0.09
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.03	0.01	*n.d.*	0.04	0.01	0.02	0.08	0.06	0.02	0.07	0.05	0.06
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.36	99.36	99.30	100.01	99.98	99.69	99.82	99.20	99.57	99.92	99.64	99.32	99.80
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.48	2.56	2.57	2.56	2.57	2.51	2.54	2.57	2.56	2.53	2.56	2.56	2.57
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.53	1.45	1.45	1.46	1.45	1.51	1.48	1.44	1.45	1.49	1.46	1.45	1.45
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.48	0.41	0.39	0.41	0.39	0.47	0.42	0.40	0.40	0.44	0.41	0.41	0.41
Na	0.51	0.59	0.59	0.58	0.58	0.52	0.56	0.58	0.59	0.54	0.58	0.57	0.58
K	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.97	4.99	4.97	4.96	4.95	5.00	4.95	4.99	4.99	4.95	4.98	4.93	4.95

Mineral							Plagioclase						
Sample	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B
Anl code	plg_2.7	plg_2.8	plg_3 ln1	plg_3 ln2	plg_3 ln3	plg_3 ln4	plg_3 ln5	plg_3.1	plg_3.2	plg_3.3	plg_3.4	plg_3.5	plg_4.1
Rock type	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite
SiO_2	56.05	57.64	56.24	52.01	52.50	51.49	57.06	55.53	56.65	56.22	57.94	56.19	55.68
TiO_2	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Al_2O_3	28.12	26.88	28.15	30.99	30.55	28.63	27.63	28.13	27.59	27.89	26.93	27.50	28.12
FeO (total)	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
MnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
MgO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
CaO	9.24	7.94	9.23	12.52	12.15	11.69	8.59	9.38	8.62	8.98	7.75	8.92	9.28
Na_2O	6.19	7.10	6.23	4.28	4.79	4.40	6.54	6.06	6.47	6.38	7.16	6.43	6.13
K_2O	0.11	0.12	0.05	0.06	0.06	0.10	0.12	0.11	0.13	0.12	0.14	0.11	0.14
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.01	0.02	0.02	0.05	*n.d.*	*n.d.*	0.02	0.04	0.01	0.01	0.02	0.05	0.03
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.72	99.69	99.93	99.91	100.05	96.32	99.96	99.25	99.47	99.60	99.93	99.20	99.38
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.52	2.59	2.52	2.36	2.38	2.39	2.55	2.51	2.55	2.53	2.59	2.54	2.52
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.49	1.42	1.49	1.66	1.63	1.57	1.46	1.50	1.46	1.48	1.42	1.47	1.50
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.45	0.38	0.44	0.61	0.59	0.58	0.41	0.45	0.42	0.43	0.37	0.43	0.45
Na	0.54	0.62	0.54	0.38	0.42	0.40	0.57	0.53	0.57	0.56	0.62	0.56	0.54
K	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.91	4.95	4.92	4.96	4.91	3.41	4.82	4.96	4.96	4.99	4.88	4.96	4.97

Mineral	Plagioclase											Garnet	
Sample	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	05 III 20	05 III 20
Anl code	plg_4.2	plg_4.3	plg_4.4	plg_4.5	plg_4.6	plg_4.7	plg_5.1	plg_5.2	plg_5.3	plg_5.4	plg_5.5	Grt 1 b1	Grt 1 c1
Rock type	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Metagabbro	Metagabbro
SiO_2	56.67	56.44	56.94	56.35	56.94	56.48	52.76	57.00	57.59	57.04	56.63	37.98	37.58
TiO_2	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.03	0.01
Al_2O_3	27.68	27.77	27.71	27.98	27.41	27.65	30.05	27.68	26.82	26.98	27.22	20.88	20.68
FeO (total)	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	28.47	29.63
MnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	1.99	1.97
MgO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	2.68	2.47
CaO	8.64	9.00	8.60	9.07	8.46	8.85	11.53	8.82	7.78	8.08	8.49	8.70	7.94
Na_2O	6.59	6.33	6.41	6.26	6.64	6.60	5.02	6.50	7.11	6.71	6.59	*n.a.*	*n.a.*
K_2O	0.12	0.13	0.11	0.14	0.11	0.10	0.05	0.07	0.12	0.14	0.13	*n.a.*	*n.a.*
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.01	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.03	0.05	0.01	*n.d.*	0.07	0.04	0.03	*n.d.*	0.02	0.02	0.03	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.72	99.73	99.78	99.80	99.62	99.72	99.44	100.07	99.45	98.97	99.09	100.74	100.28
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	12.00	12.00
Si	2.55	2.54	2.56	2.53	2.56	2.54	2.40	2.55	2.59	2.58	2.56	3.00	2.99
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.47	1.47	1.47	1.48	1.45	1.47	1.61	1.46	1.42	1.44	1.45	1.94	1.94
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.81	1.88
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.29
Ca	0.42	0.43	0.41	0.44	0.41	0.43	0.56	0.42	0.38	0.39	0.41	0.74	0.68
Na	0.57	0.55	0.56	0.55	0.58	0.58	0.44	0.56	0.62	0.59	0.58	0.00	0.00
K	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.07	0.09
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.96	4.99	4.98	4.97	4.94	4.98	4.95	4.77	4.96	4.97	4.91	8.00	8.00

Mineral							Garnet						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Grt 1 c2	Grt 1 c3	Grt 1 c4	Grt 1 b2	Grt2 c1	Grt2 b1	Grt3 c1	Grt3 c2	Grt3 b1	Grt3 c3	Grt3 b2	Grt4.1 c1	Grt4.1 c2
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	37.55	37.28	37.64	37.63	37.86	38.11	37.46	37.76	37.83	38.11	37.79	37.63	37.53
TiO_2	0.09	0.13	0.03	0.07	*n.d.*	0.03	0.16	0.03	0.06	0.15	0.13	0.24	0.09
Al_2O_3	20.70	20.36	20.77	20.69	20.92	21.15	20.56	20.79	20.78	20.68	20.66	20.64	20.66
FeO (total)	29.57	29.18	29.43	28.88	28.04	27.93	29.70	27.68	26.40	27.52	28.07	30.00	30.77
MnO	1.76	2.51	2.44	1.85	3.27	3.02	1.92	1.78	1.67	1.47	1.24	2.48	2.28
MgO	2.14	2.33	2.60	2.06	3.58	3.60	2.61	2.15	2.16	2.02	1.89	2.56	2.57
CaO	8.57	7.65	7.56	9.25	6.86	7.06	7.65	10.16	10.69	10.74	10.15	6.88	6.99
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	0.05	*n.d.*	*n.d.*	0.01	0.03
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.39	99.44	100.47	100.43	100.53	100.90	100.07	100.35	99.64	100.69	99.93	100.44	100.92
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.99	3.00	2.99	2.99	2.99	2.99	2.99	2.99	3.01	3.01	3.01	2.99	2.97
Ti	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01
Al	1.94	1.93	1.94	1.94	1.94	1.96	1.93	1.94	1.95	1.92	1.94	1.94	1.93
Fe^{2+}	1.88	1.89	1.87	1.83	1.76	1.77	1.89	1.75	1.72	1.76	1.83	1.94	1.92
Mn	0.12	0.17	0.16	0.12	0.22	0.20	0.13	0.12	0.11	0.10	0.08	0.17	0.15
Mg	0.25	0.28	0.31	0.24	0.42	0.42	0.31	0.25	0.26	0.24	0.22	0.30	0.30
Ca	0.73	0.66	0.64	0.79	0.58	0.59	0.65	0.86	0.91	0.91	0.87	0.59	0.59
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.08	0.07	0.09	0.09	0.09	0.06	0.08	0.08	0.03	0.05	0.03	0.05	0.12
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Grt4.1 b1	Grt4.1 c3	Grt4.1 c4	Grt4.1 b2	Grt4.2 b1	Grt4.2 c1	Grt4.2 c2	Grt4.2 c3	Grt4.2 c4	Grt4.2 b2	Grt5.1 c1	Grt5.1 c2	Grt5.1 b1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	37.59	37.48	37.46	37.39	37.92	37.81	37.78	37.68	37.53	37.44	37.51	37.43	38.01
TiO_2	0.07	0.82	0.07	0.18	0.05	0.06	0.02	0.18	0.10	0.06	0.60	0.07	0.02
Al_2O_3	20.88	20.73	20.87	20.54	20.92	20.83	21.01	20.72	20.79	20.64	20.72	20.56	20.76
FeO (total)	29.45	29.75	30.08	29.25	28.58	29.28	29.64	29.21	30.38	29.78	29.80	29.96	29.37
MnO	2.34	2.77	2.25	2.41	1.40	1.27	1.57	2.49	2.40	2.32	3.07	3.23	2.21
MgO	2.63	2.52	2.78	2.63	2.17	1.96	2.05	2.60	2.63	2.71	2.73	2.64	2.33
CaO	7.49	7.10	6.94	7.27	9.51	9.25	8.86	7.88	6.94	7.37	6.62	6.71	8.35
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.02	0.02	0.03	*n.d.*	0.01	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.47	101.19	100.48	99.67	100.56	100.48	100.93	100.76	100.77	100.32	101.08	100.60	101.06
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	2.96	2.97	2.99	3.00	3.00	2.99	2.98	2.98	2.98	2.97	2.98	3.00
Ti	0.00	0.05	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.04	0.00	0.00
Al	1.95	1.93	1.95	1.94	1.95	1.95	1.96	1.93	1.94	1.93	1.93	1.93	1.93
Fe^{2+}	1.87	1.92	1.90	1.90	1.84	1.89	1.88	1.84	1.91	1.87	1.91	1.87	1.87
Mn	0.16	0.19	0.15	0.16	0.09	0.09	0.11	0.17	0.16	0.16	0.21	0.22	0.15
Mg	0.31	0.30	0.33	0.31	0.26	0.23	0.24	0.31	0.31	0.32	0.32	0.31	0.27
Ca	0.64	0.60	0.59	0.62	0.81	0.79	0.75	0.67	0.59	0.63	0.56	0.57	0.71
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.08	0.05	0.10	0.06	0.05	0.05	0.08	0.09	0.10	0.11	0.06	0.12	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Grt5.1 c3	Grt5.1 b2	Grt6.1 b1	Grt6.1 c1	Grt6.1 c2	Grt6.1 c3	Grt6.1 c4	Grt6.1 b2	Grt6.2 b1	Grt6.2 c1	Grt6.2 c2	Grt6.2 b2	Grt6.3 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	37.60	37.70	37.90	37.57	37.65	37.54	37.39	37.54	37.72	37.51	37.26	37.62	37.68
TiO_2	0.02	*n.d.*	0.91	0.20	0.07	0.04	0.16	0.05	0.02	0.09	0.13	0.07	0.02
Al_2O_3	20.57	20.80	20.89	20.50	20.60	20.45	20.63	20.73	20.89	20.57	20.40	20.67	20.79
FeO (total)	30.58	29.59	30.20	31.14	31.72	32.10	31.18	30.75	30.17	31.74	31.25	31.21	29.58
MnO	2.67	2.15	2.49	2.43	2.25	2.28	2.41	2.33	2.14	2.47	2.52	2.28	1.47
MgO	2.62	2.50	2.29	2.50	2.39	2.45	2.42	2.49	2.37	2.44	2.47	2.26	2.05
CaO	6.68	7.79	7.28	6.45	6.38	6.13	6.65	6.98	7.45	6.51	6.36	7.04	9.14
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	0.05	*n.d.*	0.01	*n.d.*	0.02	0.02	0.02	0.03
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.74	100.53	101.96	100.80	101.06	101.04	100.84	100.89	100.76	101.35	100.42	101.17	100.77
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.99	2.99	2.98	2.99	2.99	2.98	2.97	2.98	2.99	2.97	2.98	2.98	2.98
Ti	0.00	0.00	0.05	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00
Al	1.92	1.94	1.94	1.92	1.93	1.91	1.93	1.94	1.95	1.92	1.92	1.93	1.94
Fe^{2+}	1.92	1.88	1.98	1.98	2.01	2.01	1.96	1.93	1.93	1.96	1.97	1.96	1.86
Mn	0.18	0.14	0.17	0.16	0.15	0.15	0.16	0.16	0.14	0.17	0.17	0.15	0.10
Mg	0.31	0.30	0.27	0.30	0.28	0.29	0.29	0.29	0.28	0.29	0.29	0.27	0.24
Ca	0.57	0.66	0.61	0.55	0.54	0.52	0.57	0.59	0.63	0.55	0.54	0.60	0.78
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.11	0.08	0.01	0.09	0.10	0.12	0.11	0.11	0.07	0.14	0.12	0.11	0.10
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	05 III 20	05 III 20	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Grt6.3 c2	Grt6.3 c3	Grt5 nv1	Grt5 nv2	Grt3 nv1	Grt3 nv2	Grt1n c1	Grt2n b1	Grt2n b2	Grt1n b1	Grt3.1n c1	Grt3.1n b1	Grt3.2n b1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	37.80	37.74	37.99	37.81	37.51	37.74	37.64	37.62	37.82	37.88	37.94	37.42	37.61
TiO_2	*n.d.*	0.04	0.09	0.04	0.07	*n.d.*	0.09	0.04	0.08	0.09	*n.d.*	0.06	*n.d.*
Al_2O_3	20.84	20.79	21.07	20.86	20.74	20.96	20.84	20.87	20.82	20.90	20.98	20.89	21.17
FeO (total)	30.39	29.22	28.92	29.82	29.51	29.13	29.99	29.67	29.10	30.09	29.24	29.07	28.49
MnO	1.26	1.73	2.05	2.57	3.18	3.35	2.43	3.07	3.21	2.47	3.41	3.04	1.74
MgO	2.03	2.32	2.17	2.29	2.30	2.34	2.24	2.44	2.39	2.29	2.33	2.38	2.37
CaO	8.47	8.70	8.62	7.05	7.13	7.43	7.37	6.97	7.29	7.29	7.16	7.46	8.90
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	*n.d.*	*n.d.*	0.02	0.03	*n.d.*	0.01	0.01	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.79	100.54	100.91	100.46	100.47	100.96	100.61	100.69	100.71	101.01	101.09	100.32	100.29
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	3.00	2.99	3.00	3.01	2.99	2.99	2.99	2.99	3.00	3.00	3.00	2.98	2.98
Ti	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00
Al	1.95	1.94	1.96	1.96	1.95	1.95	1.95	1.95	1.95	1.95	1.96	1.96	1.98
Fe^{2+}	1.94	1.86	1.88	1.96	1.89	1.85	1.93	1.89	1.88	1.94	1.88	1.85	1.82
Mn	0.08	0.12	0.14	0.17	0.21	0.22	0.16	0.21	0.22	0.17	0.23	0.20	0.12
Mg	0.24	0.27	0.26	0.27	0.27	0.28	0.27	0.29	0.28	0.27	0.27	0.28	0.28
Ca	0.72	0.74	0.73	0.60	0.61	0.63	0.63	0.59	0.62	0.62	0.61	0.64	0.76
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.08	0.03	0.03	0.08	0.08	0.06	0.08	0.05	0.05	0.05	0.08	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Grt3.2n c1	Grt3.2n c2	Grt3.2n c3	Grt3.2n b2	Grt4n c1	Grt4n b1	Grt5.1n b1	Grt5.1n b2	Grt5.1n c1	Grt5.2n b1	Grt5.2n c1	Grt5.2n c2	Grt5.2n c3
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	37.80	37.44	37.55	37.43	37.31	37.50	37.44	37.78	37.45	37.66	37.26	37.57	37.19
TiO_2	0.08	0.06	0.15	0.09	0.03	0.04	0.04	0.02	0.06	0.03	0.02	0.20	0.32
Al_2O_3	20.95	20.77	20.70	20.71	20.86	20.82	20.72	20.86	20.78	20.86	20.58	20.73	20.63
FeO (total)	28.65	29.28	29.58	29.61	27.96	28.11	29.28	28.90	29.04	29.89	30.30	29.99	29.48
MnO	2.60	3.24	3.22	3.22	3.47	3.34	2.84	2.52	2.14	2.90	2.67	2.78	3.17
MgO	2.22	2.26	2.32	2.32	1.64	1.79	2.22	2.06	2.20	2.21	2.36	2.29	2.15
CaO	8.33	7.04	7.06	6.97	8.61	8.58	7.47	8.21	8.24	6.98	7.05	7.09	7.12
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	0.01	0.03	*n.d.*	0.04	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	0.03	0.02	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.63	100.11	100.61	100.35	99.92	100.18	100.01	100.37	99.91	100.53	100.27	100.66	100.06
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	3.00	2.99	2.99	2.98	2.99	2.99	2.99	3.01	2.99	3.00	2.97	2.99	2.98
Ti	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
Al	1.96	1.96	1.94	1.95	1.97	1.96	1.95	1.96	1.96	1.96	1.94	1.94	1.95
Fe^{2+}	1.85	1.90	1.89	1.89	1.81	1.81	1.89	1.88	1.87	1.94	1.90	1.93	1.91
Mn	0.17	0.22	0.22	0.22	0.24	0.23	0.19	0.17	0.14	0.20	0.18	0.19	0.21
Mg	0.26	0.27	0.28	0.28	0.20	0.21	0.26	0.24	0.26	0.26	0.28	0.27	0.26
Ca	0.71	0.60	0.60	0.60	0.74	0.73	0.64	0.70	0.70	0.60	0.60	0.60	0.61
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.05	0.06	0.07	0.08	0.06	0.06	0.07	0.04	0.06	0.05	0.12	0.07	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Grt5.2n c4	Grt5.2n b2	Grt5.2n c5	Grt1 b1	Grt1 c1	Grt1 c2	Grt1 c3	Grt1 c4	Grt1 c6	Grt1 b1	Grt2 c1	Grt2 b1	Grt3 b1
Rock type	Metagabbro	Metagabbro	Metagabbro	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	37.33	37.12	37.49	37.71	37.39	37.52	37.62	39.39	37.46	37.54	37.49	38.09	37.80
TiO_2	0.08	0.05	0.04	0.04	0.10	0.28	0.10	0.49	0.13	0.12	0.09	*n.d.*	0.16
Al_2O_3	20.66	20.67	20.61	20.80	20.47	20.47	20.55	18.82	20.77	20.74	20.83	21.09	20.93
FeO (total)	29.49	29.23	29.94	27.57	29.20	28.99	29.47	25.67	29.63	28.40	26.35	26.28	28.46
MnO	2.87	3.03	2.77	2.63	2.99	3.40	3.00	2.25	3.30	3.17	3.53	3.48	3.63
MgO	2.23	2.25	2.29	2.40	2.34	2.41	2.50	4.02	2.45	2.36	2.15	2.25	2.17
CaO	7.29	7.27	7.10	9.39	7.79	7.39	7.30	9.03	7.21	8.01	9.78	9.63	8.03
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	0.02	0.02	0.02	0.06	*n.d.*	0.03	0.03	*n.d.*	0.01	*n.d.*	0.01	0.01
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.95	99.64	100.26	100.56	100.34	100.46	100.57	99.70	100.96	100.35	100.22	100.83	101.19
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.99	2.98	2.99	2.98	2.98	2.99	2.99	3.11	2.97	2.98	2.97	3.00	2.98
Ti	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.03	0.01	0.01	0.01	0.00	0.01
Al	1.95	1.95	1.94	1.94	1.92	1.92	1.92	1.75	1.94	1.94	1.95	1.96	1.95
Fe^{2+}	1.90	1.87	1.92	1.72	1.83	1.85	1.87	1.70	1.84	1.81	1.65	1.68	1.81
Mn	0.19	0.21	0.19	0.18	0.20	0.23	0.20	0.15	0.22	0.21	0.24	0.23	0.24
Mg	0.27	0.27	0.27	0.28	0.28	0.29	0.30	0.47	0.29	0.28	0.25	0.26	0.26
Ca	0.63	0.63	0.61	0.80	0.66	0.63	0.62	0.76	0.61	0.68	0.83	0.81	0.68
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.09	0.08	0.10	0.11	0.08	0.09	0.00	0.12	0.08	0.10	0.05	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	7.98	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Grt3 c1	Grt3 c2	Grt3 c3	Grt3 b2	Grt3 c4	Grt3 c5	Grt3 c6	Grt3 c7	Grt3 b3	Grt4 b1	Grt4 c1	Grt4 c2	Grt4 c3
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	37.34	37.54	37.64	37.85	37.68	35.93	37.53	37.42	37.69	40.36	37.43	37.54	37.52
TiO_2	0.16	0.11	0.05	*n.d.*	0.05	2.34	0.17	0.09	0.07	0.74	0.19	0.06	0.08
Al_2O_3	20.46	20.60	20.53	21.00	20.70	19.17	20.70	20.56	20.91	16.23	20.53	20.47	20.73
FeO (total)	29.44	29.52	30.20	28.44	30.02	28.90	29.79	30.25	27.88	23.41	29.28	29.36	29.22
MnO	3.62	3.64	3.15	2.91	2.98	3.77	3.38	3.51	2.52	1.86	2.99	3.37	3.17
MgO	2.27	2.30	2.46	2.32	2.48	1.96	2.35	2.47	2.31	5.57	2.26	2.37	2.22
CaO	7.22	6.64	6.82	8.00	6.74	6.31	6.64	6.49	8.91	9.65	7.71	7.22	7.45
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.03	*n.d.*	0.04	*n.d.*	0.02	*n.d.*	*n.d.*	0.01	0.02	0.03	0.03	0.03	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.54	100.35	100.89	100.52	100.67	98.38	100.56	100.80	100.31	97.84	100.42	100.42	100.39
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	3.00	2.99	3.00	2.99	2.95	2.99	2.97	2.99	3.22	2.98	2.99	2.99
Ti	0.01	0.01	0.00	0.00	0.00	0.14	0.01	0.01	0.00	0.04	0.01	0.00	0.00
Al	1.92	1.94	1.92	1.96	1.94	1.85	1.94	1.93	1.96	1.53	1.93	1.92	1.95
Fe^{2+}	1.85	1.91	1.90	1.84	1.92	1.98	1.92	1.89	1.79	1.56	1.86	1.86	1.87
Mn	0.24	0.25	0.21	0.20	0.20	0.26	0.23	0.24	0.17	0.13	0.20	0.23	0.21
Mg	0.27	0.27	0.29	0.27	0.29	0.24	0.28	0.29	0.27	0.66	0.27	0.28	0.26
Ca	0.62	0.57	0.58	0.68	0.57	0.55	0.57	0.55	0.76	0.83	0.66	0.62	0.64
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.12	0.06	0.10	0.04	0.07	0.00	0.07	0.12	0.06	0.00	0.09	0.09	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	7.98	8.00	8.00	8.00	7.97	8.00	8.00	8.00

Mineral							Garnet						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Grt4 b2	Grt4 c4	Grt4 c5	Grt4 c6	Grt4 b4	Grt5 c1	Grt5 b1	Grt1 nv1	Grt1 nv2	Grt5 nv1	Grt5 nv2	Grt1.1n b1	Grt1.1n c1
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	37.63	37.52	37.73	38.03	37.36	37.77	37.50	36.51	37.99	37.81	37.65	37.63	37.39
TiO_2	0.03	0.14	0.15	0.09	0.05	0.09	*n.d.*	0.05	0.06	0.06	0.06	0.04	0.11
Al_2O_3	20.77	20.61	20.72	20.91	20.80	21.01	20.79	20.27	20.99	20.75	20.96	20.96	20.65
FeO (total)	28.61	28.87	29.44	28.90	28.34	27.45	26.54	28.93	29.91	29.67	30.09	28.79	30.69
MnO	3.11	3.53	3.28	3.51	3.59	2.81	2.88	1.81	1.21	1.05	0.91	1.92	0.70
MgO	2.23	2.20	2.30	2.15	2.09	2.34	2.27	2.56	2.07	2.39	2.30	2.89	1.50
CaO	8.00	7.47	7.55	7.85	8.12	9.20	10.44	9.07	8.95	8.68	8.76	8.28	9.53
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	*n.d.*	0.01	*n.d.*	0.02	0.02	0.03	0.03	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.38	100.34	101.18	101.44	100.37	100.69	100.45	99.22	101.17	100.42	100.72	100.51	100.57
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.99	2.99	2.98	3.00	2.97	2.98	2.96	2.93	2.99	3.00	2.98	2.97	2.98
Ti	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Al	1.95	1.94	1.93	1.94	1.95	1.96	1.94	1.92	1.95	1.94	1.95	1.95	1.94
Fe^{2+}	1.83	1.85	1.85	1.84	1.79	1.74	1.61	1.72	1.91	1.90	1.90	1.80	1.94
Mn	0.21	0.24	0.22	0.23	0.24	0.19	0.19	0.12	0.08	0.07	0.06	0.13	0.05
Mg	0.26	0.26	0.27	0.25	0.25	0.28	0.27	0.31	0.24	0.28	0.27	0.34	0.18
Ca	0.68	0.64	0.64	0.66	0.69	0.78	0.88	0.78	0.76	0.74	0.74	0.70	0.81
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.07	0.09	0.06	0.10	0.07	0.14	0.23	0.06	0.06	0.09	0.10	0.11
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Grt1.1n b2	Grt1.2n b1	Grt1.2n c1	Grt1.2n c2	Grt1.2n b2	Grt1.3n b1	Grt1.3n c1	Grt1.3n c2	Grt1.3n c3	Grt1.3n c4	Grt1.3n c5	Grt1.3n b2	Grt2n b1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	37.56	37.69	37.27	37.50	37.70	37.12	37.14	37.31	37.14	37.16	37.50	37.44	37.60
TiO_2	0.07	0.05	0.05	*n.d.*	0.10	0.06	0.05	0.41	0.59	0.32	0.31	0.24	*n.d.*
Al_2O_3	20.90	20.65	20.67	20.59	20.67	20.56	20.51	20.77	20.59	20.70	20.69	20.62	20.74
FeO (total)	29.21	29.83	29.48	30.03	30.25	30.32	30.17	30.84	30.74	30.26	30.33	30.50	29.67
MnO	1.50	2.06	1.93	1.96	1.89	2.14	2.20	2.20	2.26	2.18	2.23	2.13	2.28
MgO	2.26	2.64	2.63	2.77	2.74	2.63	2.68	2.72	2.61	2.70	2.70	2.59	2.82
CaO	9.12	7.14	8.14	7.33	7.23	7.03	7.03	6.64	6.49	6.95	6.74	6.85	7.17
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	*n.d.*	0.03	0.03	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	*n.d.*	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.62	100.06	100.20	100.21	100.58	99.88	99.78	100.89	100.42	100.31	100.50	100.37	100.28
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.97	3.00	2.96	2.98	2.99	2.97	2.97	2.96	2.96	2.96	2.98	2.98	2.99
Ti	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.04	0.02	0.02	0.01	0.00
Al	1.95	1.94	1.94	1.93	1.93	1.94	1.93	1.94	1.94	1.94	1.94	1.94	1.94
Fe^{2+}	1.83	1.94	1.82	1.89	1.92	1.90	1.90	1.94	1.97	1.91	1.95	1.95	1.88
Mn	0.10	0.14	0.13	0.13	0.13	0.14	0.15	0.15	0.15	0.15	0.15	0.14	0.15
Mg	0.27	0.31	0.31	0.33	0.32	0.31	0.32	0.32	0.31	0.32	0.32	0.31	0.33
Ca	0.77	0.61	0.69	0.62	0.61	0.60	0.60	0.56	0.55	0.59	0.57	0.58	0.61
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.10	0.05	0.14	0.11	0.08	0.12	0.12	0.10	0.08	0.10	0.07	0.08	0.09
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Grt2n b2	Grt2n c1	Grt2n c2	Grt2n c3	Grt2n b3	Grt4n b1	Grt4n b2	Grt4n b3	Grt4n c1	Grt4n c2	Grt4n c3	Grt4n c4	Grt4n b4
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	37.69	37.03	37.11	37.09	37.13	37.51	37.48	37.44	37.33	37.63	37.43	37.26	37.41
TiO_2	0.13	0.14	0.17	0.08	0.03	0.14	0.04	*n.d.*	0.14	0.07	0.03	0.05	0.10
Al_2O_3	20.70	20.47	20.39	20.84	20.31	20.43	20.54	20.70	20.57	20.61	20.64	20.63	20.54
FeO (total)	30.27	30.43	30.09	29.78	29.18	31.02	30.48	29.57	30.33	29.22	29.91	29.13	29.74
MnO	2.36	2.35	2.36	2.32	2.03	1.75	1.54	1.08	1.37	1.11	1.03	1.01	0.92
MgO	2.73	2.72	2.79	2.84	2.76	2.78	2.67	2.29	2.31	2.02	2.17	2.22	2.13
CaO	6.80	6.57	6.63	7.05	7.48	6.62	7.35	8.93	8.13	9.19	9.02	8.96	8.98
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.04	*n.d.*	0.03	0.02	0.03	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.72	99.72	99.57	100.02	98.95	100.25	100.10	100.03	100.18	99.85	100.23	99.26	99.81
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.99	2.97	2.98	2.96	2.99	2.99	2.99	2.98	2.98	3.00	2.98	2.99	2.99
Ti	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Al	1.93	1.93	1.93	1.96	1.93	1.92	1.93	1.94	1.93	1.94	1.94	1.95	1.93
Fe^{2+}	1.93	1.92	1.92	1.86	1.87	1.98	1.93	1.87	1.92	1.90	1.88	1.88	1.90
Mn	0.16	0.16	0.16	0.16	0.14	0.12	0.10	0.07	0.09	0.08	0.07	0.07	0.06
Mg	0.32	0.33	0.33	0.34	0.33	0.33	0.32	0.27	0.27	0.24	0.26	0.27	0.25
Ca	0.58	0.56	0.57	0.60	0.65	0.57	0.63	0.76	0.69	0.79	0.77	0.77	0.77
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.08	0.12	0.10	0.13	0.10	0.09	0.10	0.10	0.11	0.05	0.11	0.07	0.08
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral	Garnet										Biotite		
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	05 III 20	05 III 20	05 III 20
Anl code	Grt5n b1	Grt5n b2	Grt5n b3	Grt5n c1	Grt5n c2	Grt5n c3	Grt5n c4	Grt5n c5	Grt5n b4	Grt5n b5	Bt1.1 b1	Bt1.1 c1	Bt1.2 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	37.39	37.26	35.78	37.64	37.45	37.54	37.21	37.06	36.86	37.12	35.26	35.94	35.48
TiO_2	0.04	0.18	2.48	0.06	0.03	0.05	0.03	*n.d.*	0.07	*n.d.*	3.90	3.74	3.78
Al_2O_3	20.76	20.73	19.93	20.56	20.70	20.73	20.89	20.97	20.64	20.61	15.27	15.35	15.38
FeO (total)	30.12	31.09	31.41	29.95	29.24	29.77	29.41	29.94	30.64	30.86	19.27	19.69	19.39
MnO	1.73	1.64	1.62	1.80	1.39	0.78	0.98	0.60	0.88	1.53	0.08	0.07	0.08
MgO	2.70	2.65	2.51	2.68	2.42	2.01	2.36	1.95	2.25	2.67	10.83	10.78	10.89
CaO	7.06	6.74	6.76	7.57	8.75	9.74	9.10	9.50	8.63	7.15	0.04	0.05	0.04
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.08	0.06	0.08
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	9.73	9.80	9.81
Cr_2O_3	0.04	*n.d.*	*n.d.*	*n.d.*	0.02	0.03	0.02	*n.d.*	0.03	0.02	0.01	0.02	0.02
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.d.*	0.04	0.04
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.42	0.36	0.39
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.84	100.29	100.49	100.26	100.00	100.64	100.00	100.02	100.00	99.96	94.87	95.89	94.99
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	11.00	11.00	11.00
Si	2.99	2.97	2.87	2.99	2.98	2.97	2.96	2.95	2.94	2.96	2.73	2.75	2.73
Ti	0.00	0.01	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.22	0.22
Al	1.95	1.95	1.88	1.93	1.94	1.93	1.96	1.97	1.94	1.94	1.39	1.38	1.40
Fe^{2+}	1.94	1.97	2.02	1.91	1.85	1.85	1.83	1.86	1.87	1.92	1.25	1.26	1.25
Mn	0.12	0.11	0.11	0.12	0.09	0.05	0.07	0.04	0.06	0.10	0.01	0.00	0.01
Mg	0.32	0.31	0.30	0.32	0.29	0.24	0.28	0.23	0.27	0.32	1.25	1.23	1.25
Ca	0.60	0.58	0.58	0.65	0.75	0.83	0.78	0.81	0.74	0.61	0.00	0.00	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.96	0.96
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.10	0.08	0.09	0.10	0.12	0.12	0.13	0.17	0.14	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	7.84	7.83	7.84

Mineral							Biotite						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Bt1.3 c1	Bt1.4 c1	Bt2.1 c1	Bt2.2 c1	Bt2.3 c1	Bt2.4 c1	Bt2.5 c1	Bt2.6 c1	Bt2.7 c1	Bt2.8 c1	Bt2.9 c1	Bt2.10 c1	Bt 3.1 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	36.71	34.28	35.31	33.21	31.79	35.87	35.67	36.05	35.66	37.65	35.07	35.33	35.33
TiO_2	3.98	3.50	3.51	4.14	3.81	3.86	3.83	3.89	4.11	4.14	3.98	3.90	4.02
Al_2O_3	15.70	15.76	15.11	15.29	14.65	14.97	14.95	15.08	14.95	15.90	14.88	14.91	14.73
FeO (total)	19.63	19.73	19.13	20.86	19.97	18.05	18.13	17.98	19.57	19.04	19.20	18.75	20.15
MnO	0.13	0.07	0.06	0.05	0.08	0.09	0.06	0.04	0.06	0.03	0.06	0.02	0.11
MgO	10.35	10.76	11.20	11.30	11.13	12.43	12.39	12.43	11.30	10.40	11.30	12.19	11.12
CaO	0.10	0.21	0.17	1.08	0.95	0.04	0.06	0.05	0.05	0.13	0.01	0.08	0.10
Na_2O	0.13	0.16	0.10	0.10	0.09	0.15	0.13	0.13	0.11	0.12	0.09	0.13	0.15
K_2O	9.46	9.26	8.84	6.03	6.55	9.56	9.72	9.89	9.75	8.98	9.26	9.17	9.50
Cr_2O_3	0.01	0.02	0.03	0.03	*n.d.*	0.03	0.03	*n.d.*	*n.d.*	0.04	0.02	0.01	0.06
ZnO	0.02	0.03	0.05	0.01	0.01	0.02	0.04	0.02	0.03	0.05	0.01	0.04	0.04
BaO	0.40	0.26	0.30	0.25	0.26	0.33	0.40	0.33	0.36	0.36	0.34	0.34	0.60
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	96.21	93.78	93.51	92.09	89.03	95.07	95.00	95.56	95.59	96.47	93.87	94.53	95.31
Oxygens	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Si	2.77	2.68	2.75	2.62	2.61	2.74	2.73	2.74	2.73	2.81	2.73	2.72	2.72
Ti	0.23	0.21	0.21	0.25	0.24	0.22	0.22	0.22	0.24	0.23	0.23	0.23	0.23
Al	1.40	1.45	1.39	1.42	1.42	1.35	1.35	1.35	1.35	1.40	1.36	1.35	1.34
Fe^{2+}	1.24	1.29	1.24	1.38	1.37	1.15	1.16	1.14	1.25	1.19	1.25	1.21	1.30
Mn	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Mg	1.17	1.25	1.30	1.33	1.36	1.41	1.41	1.41	1.29	1.16	1.31	1.40	1.28
Ca	0.01	0.02	0.01	0.09	0.08	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01
Na	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02
K	0.91	0.92	0.88	0.61	0.69	0.93	0.95	0.96	0.95	0.86	0.92	0.90	0.93
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.77	7.86	7.80	7.73	7.80	7.85	7.86	7.86	7.85	7.69	7.83	7.84	7.86

Mineral							Biotite						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Bt 3.3 c1	Bt 3.4 c1	Bt 3.2 c1	Bt 3.5 c1	Bt 3.6 c1	Bt 3.7 c1	Bt 3.8 c1	Bt 3.9 c1	Bt 4.1 c1	Bt 4.2 c1	Bt 4.3 c1	Bt 5.1 c1	Bt 5.2 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	35.62	34.78	33.66	35.42	36.07	33.95	36.56	35.54	35.89	34.64	32.45	35.79	36.55
TiO_2	4.15	4.35	4.70	4.06	3.92	4.15	4.36	4.16	3.71	4.37	2.65	4.59	3.95
Al_2O_3	15.22	14.66	14.62	14.91	15.15	14.08	15.15	15.10	15.15	14.79	15.07	14.97	15.18
FeO (total)	20.35	20.21	19.33	20.17	19.62	20.63	20.52	21.02	20.71	20.98	21.54	18.85	19.23
MnO	0.02	0.07	0.05	0.12	0.11	0.06	0.05	0.05	0.08	0.09	0.03	0.06	0.13
MgO	10.95	10.93	12.01	10.71	11.10	11.47	10.37	10.31	11.04	10.13	13.29	11.43	11.73
CaO	0.07	0.10	1.39	0.11	0.13	0.19	0.05	0.15	0.14	0.07	0.39	0.75	0.11
Na_2O	0.11	0.15	0.12	0.16	0.12	0.15	0.12	0.13	0.16	0.19	0.07	0.10	0.09
K_2O	9.41	9.49	6.75	9.92	9.59	9.11	9.78	8.71	9.33	9.15	5.48	9.11	9.64
Cr_2O_3	0.02	*n.d.*	*n.d.*	*n.d.*	0.01	0.01	0.04	*n.d.*	0.02	0.03	0.02	*n.d.*	0.03
ZnO	0.03	0.01	0.04	0.03	0.03	0.06	0.04	0.02	0.03	0.02	0.02	0.02	0.01
BaO	0.58	0.59	0.34	0.39	0.64	0.51	0.53	0.45	0.63	1.24	0.12	0.15	0.14
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	95.94	94.76	92.66	95.60	95.86	93.86	97.03	95.18	96.25	94.46	91.01	95.68	96.65
Oxygens	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Si	2.72	2.70	2.64	2.73	2.75	2.67	2.76	2.73	2.73	2.70	2.60	2.72	2.75
Ti	0.24	0.25	0.28	0.23	0.22	0.25	0.25	0.24	0.21	0.26	0.16	0.26	0.22
Al	1.37	1.34	1.35	1.35	1.36	1.31	1.35	1.37	1.36	1.36	1.42	1.34	1.35
Fe^{2+}	1.30	1.31	1.27	1.30	1.25	1.36	1.29	1.35	1.32	1.37	1.44	1.20	1.21
Mn	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01
Mg	1.25	1.26	1.40	1.23	1.26	1.35	1.17	1.18	1.25	1.18	1.59	1.30	1.32
Ca	0.01	0.01	0.12	0.01	0.01	0.02	0.00	0.01	0.01	0.01	0.03	0.06	0.01
Na	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.01	0.02	0.01
K	0.92	0.94	0.67	0.97	0.93	0.91	0.94	0.85	0.91	0.91	0.56	0.88	0.93
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.01	0.02	0.04	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.83	7.86	7.76	7.87	7.83	7.90	7.80	7.78	7.84	7.84	7.82	7.80	7.82

Mineral							Biotite						
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Bt 5.3 c1	Bt 5.4 b1	Bt 5.4 c1	Bt 5.4 b2	Bt6.1 c1	Bt6.2 c1	Bt6.3 c1	Bt6.3 b1	Bt6.4 c1	Bt6.5 c1	Bt6.6 c1	Bt6.7 c1	Bt6.8 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	35.82	36.76	36.26	36.03	35.83	35.53	35.61	33.91	36.26	34.80	36.03	34.74	35.27
TiO_2	4.05	4.57	4.15	4.30	3.91	3.82	4.43	4.27	4.09	4.46	4.09	4.34	3.94
Al_2O_3	14.77	14.88	15.01	15.03	15.23	15.04	14.66	13.88	14.99	15.19	15.80	14.33	14.78
FeO (total)	19.09	18.90	19.58	19.32	19.92	20.64	21.25	21.35	21.45	22.06	22.62	21.68	21.93
MnO	0.09	0.05	0.12	0.07	*n.d.*	0.02	0.03	0.04	0.01	0.06	0.07	0.06	0.10
MgO	12.00	11.59	11.69	11.86	11.68	10.61	10.11	10.82	10.02	10.41	9.28	10.32	9.99
CaO	0.04	0.02	0.05	0.09	0.05	0.04	0.02	0.08	0.08	0.64	0.27	0.12	0.10
Na_2O	0.08	0.09	0.09	0.08	0.12	0.09	0.07	0.12	0.13	0.10	0.11	0.10	0.22
K_2O	9.95	9.94	9.33	9.31	9.30	9.29	9.34	9.36	9.37	7.53	7.86	9.09	9.34
Cr_2O_3	0.01	*n.d.*	*n.d.*	0.01	0.03	*n.d.*	0.01	*n.d.*	0.03	0.03	*n.d.*	*n.d.*	0.01
ZnO	0.06	*n.d.*	0.02	0.01	0.01	*n.d.*	0.04	0.04	0.02	0.05	0.04	0.04	0.03
BaO	0.18	0.21	0.16	0.23	0.43	0.49	0.45	0.37	0.41	0.43	0.36	0.48	0.46
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	95.97	96.81	96.30	96.11	96.08	95.09	95.58	93.87	96.45	95.32	96.16	94.82	95.70
Oxygens	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Si	2.73	2.76	2.74	2.73	2.72	2.74	2.74	2.68	2.76	2.68	2.74	2.71	2.73
Ti	0.23	0.26	0.24	0.25	0.22	0.22	0.26	0.25	0.23	0.26	0.23	0.25	0.23
Al	1.33	1.32	1.34	1.34	1.36	1.37	1.33	1.29	1.35	1.38	1.42	1.32	1.35
Fe^{2+}	1.22	1.19	1.24	1.22	1.27	1.33	1.37	1.41	1.37	1.42	1.44	1.41	1.42
Mn	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Mg	1.36	1.30	1.32	1.34	1.32	1.22	1.16	1.28	1.14	1.19	1.05	1.20	1.15
Ca	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.05	0.02	0.01	0.01
Na	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.01	0.02	0.02	0.03
K	0.97	0.95	0.90	0.90	0.90	0.91	0.92	0.94	0.91	0.74	0.76	0.90	0.92
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.87	7.81	7.81	7.81	7.83	7.82	7.80	7.90	7.80	7.75	7.71	7.84	7.85

Mineral							Biotite						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Bt1.1 c1	Bt1.2 c1	Bt1.3 c1	Bt1.4 c1	Bt5 .1 c1	Bt5 .2 c1	Bt5.3 c1	Bt2.1 c1	Bt2.2 c1	Bt2.3 c1	Bt2.4 c1	Bt3.1 c1	Bt3.2 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	34.93	35.22	35.48	34.44	35.80	35.70	35.69	36.48	34.92	30.95	28.50	34.36	37.03
TiO_2	4.34	3.75	4.10	4.17	4.27	4.09	4.08	4.62	4.09	7.37	4.22	4.15	3.88
Al_2O_3	14.63	15.11	14.52	14.33	15.03	14.95	15.18	15.13	15.24	12.86	11.87	14.24	15.43
FeO (total)	22.40	22.81	21.89	21.79	21.85	22.02	22.33	21.05	22.18	19.51	21.00	19.77	19.27
MnO	0.05	0.07	0.08	0.03	0.07	0.08	0.06	0.12	0.10	0.03	0.08	0.10	0.06
MgO	9.54	9.29	9.75	9.77	9.22	9.41	9.36	9.05	9.61	9.22	6.73	12.59	10.85
CaO	0.14	0.15	0.02	0.07	0.06	0.19	0.16	0.12	0.43	4.19	0.96	0.11	0.09
Na_2O	0.09	0.08	0.12	0.10	0.11	0.12	0.15	0.20	0.14	0.06	0.10	0.20	0.15
K_2O	8.57	7.94	9.46	9.36	9.38	9.09	8.58	9.28	6.84	3.92	7.57	8.58	8.99
Cr_2O_3	0.02	0.01	0.01	0.02	0.03	0.04	0.05	*n.d.*	*n.d.*	0.03	*n.d.*	0.02	0.03
ZnO	*n.d.*	0.03	*n.d.*	0.05	0.01	0.06	0.05	0.03	0.04	*n.d.*	0.02	0.03	0.03
BaO	0.38	0.33	0.54	0.49	0.58	0.57	0.50	0.70	0.51	0.19	0.51	0.69	0.73
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	94.70	94.47	95.42	94.13	95.84	95.74	95.69	96.08	93.58	88.14	81.05	94.15	95.81
Oxygens	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Si	2.72	2.74	2.75	2.71	2.75	2.75	2.74	2.78	2.72	2.56	2.65	2.67	2.79
Ti	0.25	0.22	0.24	0.25	0.25	0.24	0.24	0.26	0.24	0.46	0.30	0.24	0.22
Al	1.34	1.39	1.33	1.33	1.36	1.36	1.38	1.36	1.40	1.25	1.30	1.30	1.37
Fe^{2+}	1.46	1.49	1.42	1.44	1.40	1.42	1.44	1.34	1.45	1.35	1.64	1.28	1.22
Mn	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00
Mg	1.11	1.08	1.13	1.15	1.06	1.08	1.07	1.03	1.12	1.14	0.93	1.46	1.22
Ca	0.01	0.01	0.00	0.01	0.01	0.02	0.01	0.01	0.04	0.37	0.10	0.01	0.01
Na	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.03	0.02	0.01	0.02	0.03	0.02
K	0.85	0.79	0.93	0.94	0.92	0.89	0.84	0.90	0.68	0.41	0.90	0.85	0.87
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.78	7.75	7.83	7.85	7.79	7.79	7.77	7.74	7.69	7.57	7.86	7.88	7.75

Mineral							Biotite						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Bt3.3 c1	Bt3.4 c1	Bt3.5 c1	Bt3.6 c1	Bt3.7 c1	Bt3.8 c1	Bt3.9 c1	Bt4.1 c1	Bt4.2 c1	Bt4.3 c1	Bt4.4 c1	Bt4.4 b1	Bt4.5 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	37.86	36.57	36.29	36.20	35.16	35.61	35.09	34.27	36.20	37.20	35.70	35.72	4.44
TiO_2	6.61	4.29	4.03	3.59	4.02	4.19	4.01	3.96	4.10	4.21	3.71	3.45	45.54
Al_2O_3	15.33	15.09	14.91	15.20	14.47	14.77	14.95	14.55	15.59	16.07	15.85	16.09	2.00
FeO (total)	17.72	21.12	20.50	20.17	20.86	21.95	21.85	21.35	21.58	21.26	21.76	21.73	39.77
MnO	0.06	0.07	*n.d.*	0.09	0.13	0.14	0.10	0.08	0.11	0.07	0.10	0.09	1.13
MgO	2.66	9.25	10.35	10.05	11.01	9.79	8.75	10.75	9.77	8.96	9.99	7.46	1.00
CaO	2.96	0.10	0.19	0.24	0.18	0.14	0.27	0.17	0.07	0.27	0.07	0.41	0.84
Na_2O	0.04	0.14	0.16	0.15	0.19	0.17	0.18	0.13	0.15	0.11	0.11	0.07	0.03
K_2O	4.64	9.44	9.20	8.34	9.07	9.01	8.61	9.08	9.45	8.80	8.25	7.21	0.58
Cr_2O_3	0.02	0.02	0.05	0.02	0.06	0.02	0.05	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*
ZnO	0.05	0.02	0.07	0.05	0.01	*n.d.*	0.03	0.02	0.01	*n.d.*	0.03	0.02	0.03
BaO	0.27	0.70	0.69	0.59	0.69	0.60	0.47	0.31	0.40	0.36	0.30	0.23	*n.d.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	87.94	96.11	95.76	94.10	95.16	95.79	93.89	94.37	97.03	96.95	95.56	92.27	95.37
Oxygens	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Si	3.02	2.79	2.77	2.79	2.72	2.74	2.75	2.69	2.74	2.79	2.73	2.81	0.41
Ti	0.40	0.25	0.23	0.21	0.23	0.24	0.24	0.23	0.23	0.24	0.21	0.20	3.19
Al	1.44	1.36	1.34	1.38	1.32	1.34	1.38	1.34	1.39	1.42	1.43	1.49	0.22
Fe^{2+}	1.18	1.35	1.31	1.30	1.35	1.41	1.43	1.40	1.37	1.34	1.39	1.43	3.10
Mn	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.09
Mg	0.32	1.05	1.18	1.16	1.27	1.12	1.02	1.26	1.10	1.00	1.14	0.88	0.14
Ca	0.25	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.03	0.08
Na	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.00
K	0.47	0.92	0.90	0.82	0.89	0.88	0.86	0.91	0.91	0.84	0.81	0.72	0.07
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.10	7.76	7.79	7.73	7.85	7.81	7.77	7.88	7.80	7.69	7.75	7.61	7.31

Mineral							Biotite						
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Bt4.6 c1	Bt4.7 c1	Bt4.8 c1	Bt4.9 c1	Bt1.1 c1	Bt1.2 c1	Bt1.3 c1	Bt1.4 c1	Bt2.1 c1	Bt2.1 b1	Bt2.2 b1	Bt2.2 c1	Bt2.2 b2
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	32.03	34.79	35.66	33.03	29.67	31.37	33.67	29.42	35.57	35.52	36.10	35.74	35.62
TiO_2	10.60	4.14	4.33	4.58	0.99	2.50	2.25	0.62	3.27	3.33	3.49	3.41	3.38
Al_2O_3	11.78	14.74	15.13	14.14	18.02	15.83	17.50	18.27	15.97	16.05	15.84	15.95	16.11
FeO (total)	16.63	21.31	21.84	20.92	26.36	21.10	22.49	25.90	21.43	21.44	21.02	21.10	21.16
MnO	0.04	0.09	0.10	0.04	0.05	0.02	0.06	0.07	0.13	0.08	0.13	0.11	0.09
MgO	8.68	10.40	10.24	10.83	12.92	11.14	10.75	11.00	10.21	10.07	10.04	10.17	9.75
CaO	6.26	0.04	0.09	0.45	0.19	0.56	0.59	0.40	0.08	0.08	0.07	0.04	0.12
Na_2O	0.10	0.11	0.10	0.13	0.03	0.07	0.06	0.05	0.07	0.08	0.04	0.05	0.07
K_2O	6.61	9.49	9.73	8.76	0.32	1.04	1.25	0.21	9.65	9.53	9.70	9.45	9.41
Cr_2O_3	0.01	0.04	*n.d.*	0.03	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.03	0.04	0.01	*n.d.*
ZnO	0.02	0.03	0.03	0.05	*n.d.*	*n.d.*	0.06	*n.d.*	0.02	*n.d.*	*n.d.*	0.04	0.01
BaO	0.23	0.35	0.42	0.37	*n.d.*	0.01	0.05	0.02	0.49	0.62	0.70	0.61	0.62
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	92.75	95.18	97.25	92.96	88.55	83.63	88.67	85.93	96.39	96.21	96.46	96.07	95.72
Oxygens	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Si	2.54	2.70	2.71	2.63	2.43	2.65	2.68	2.47	2.72	2.71	2.74	2.73	2.73
Ti	0.63	0.24	0.25	0.27	0.06	0.16	0.13	0.04	0.19	0.19	0.20	0.20	0.19
Al	1.10	1.35	1.36	1.33	1.74	1.58	1.64	1.81	1.44	1.45	1.42	1.44	1.46
Fe^{2+}	1.10	1.38	1.39	1.39	1.80	1.49	1.50	1.82	1.37	1.37	1.34	1.35	1.36
Mn	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Mg	1.03	1.20	1.16	1.29	1.58	1.40	1.28	1.38	1.16	1.15	1.14	1.16	1.11
Ca	0.53	0.00	0.01	0.04	0.02	0.05	0.05	0.04	0.01	0.01	0.01	0.00	0.01
Na	0.01	0.02	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
K	0.67	0.94	0.94	0.89	0.03	0.11	0.13	0.02	0.94	0.93	0.94	0.92	0.92
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.62	7.86	7.85	7.89	7.66	7.46	7.43	7.60	7.85	7.84	7.82	7.82	7.82

Mineral							Biotite						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	PNF 01A
Anl code	Bt3.1 c1	Bt3.2 c1	Bt3.3 c1	Bt3.4 c1	Bt3.5 c1	Bt3.6 c1	Bt4.1 c1	Bt4.2 c1	Bt4.3 c1	Bt4.4 c1	Bt4.5 c1	Bt4.6 c1	Bt1.1 c1
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Metagabbro
SiO_2	33.35	34.05	30.34	36.17	33.32	35.92	34.52	31.18	33.88	34.28	35.20	34.15	35.92
TiO_2	4.05	3.45	3.26	4.28	3.02	4.38	2.95	3.25	4.04	4.25	4.24	3.77	3.66
Al_2O_3	15.29	16.52	14.72	14.67	15.78	14.76	16.76	15.05	16.67	15.31	15.21	15.46	15.54
FeO (total)	22.94	23.46	23.61	21.54	23.63	21.71	22.62	23.14	22.39	21.84	21.16	22.35	18.74
MnO	0.05	0.05	0.07	0.09	0.10	0.10	0.08	0.07	0.08	0.05	0.04	0.09	0.06
MgO	10.26	10.05	8.86	9.81	9.99	9.73	10.28	9.51	8.84	9.92	9.79	9.90	6.82
CaO	0.17	0.29	0.26	0.14	0.27	0.21	0.26	0.75	1.64	0.15	0.14	0.16	0.16
Na_2O	0.06	0.10	0.08	0.12	0.08	0.15	0.08	0.08	0.07	0.10	0.14	0.12	0.09
K_2O	5.79	3.31	3.81	9.45	4.04	8.78	4.38	3.47	3.47	7.79	8.94	7.94	8.74
Cr_2O_3	0.03	*n.d.*	0.04	0.04	0.02	0.04	0.01	*n.d.*	0.04	0.05	0.01	*n.d.*	0.02
ZnO	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	0.04	*n.d.*	*n.d.*	0.03	*n.d.*	0.01
BaO	0.38	0.16	0.27	0.40	0.18	0.49	0.43	0.25	0.32	0.56	0.68	0.52	1.01
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	92.02	91.27	85.05	96.31	90.25	95.78	91.95	86.54	91.11	93.75	94.89	93.94	89.76
Oxygens	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Si	2.65	2.68	2.62	2.77	2.68	2.75	2.70	2.63	2.67	2.68	2.72	2.68	2.89
Ti	0.24	0.20	0.21	0.25	0.18	0.25	0.17	0.21	0.24	0.25	0.25	0.22	0.22
Al	1.43	1.53	1.50	1.32	1.50	1.33	1.54	1.49	1.55	1.41	1.39	1.43	1.47
Fe^{2+}	1.52	1.55	1.70	1.38	1.59	1.39	1.48	1.63	1.48	1.43	1.37	1.46	1.26
Mn	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.00
Mg	1.22	1.18	1.14	1.12	1.20	1.11	1.20	1.19	1.04	1.16	1.13	1.16	0.82
Ca	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.07	0.14	0.01	0.01	0.01	0.01
Na	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.01
K	0.59	0.33	0.42	0.92	0.41	0.86	0.44	0.37	0.35	0.78	0.88	0.79	0.90
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.69	7.52	7.64	7.80	7.61	7.77	7.58	7.62	7.49	7.76	7.79	7.80	7.61

Mineral							Biotite						
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B
Anl code	Bt1.2 c1	Bt1.3 c1	Bt1.4 c1	Bt1.5 c1	Bt2.1 c1	Bt2.2 c1	bt_1.1	bt_1.2	bt_1.3	bt_2.1	bt_2.2	bt_2.3	bt_3.1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite
SiO_2	35.07	37.01	31.85	36.19	36.74	36.35	35.81	35.76	35.95	35.71	36.14	35.66	35.44
TiO_2	3.83	4.52	6.84	3.71	3.87	3.84	2.19	2.17	2.03	2.10	2.02	2.09	2.25
Al_2O_3	16.29	16.20	14.44	16.37	16.34	16.10	16.43	16.64	16.67	16.23	16.63	16.53	16.89
FeO (total)	18.65	20.37	21.34	21.90	18.63	17.96	19.56	19.59	19.75	19.31	19.49	19.29	19.00
MnO	0.05	0.09	0.06	0.04	0.08	0.04	0.17	0.17	0.18	0.14	0.17	0.17	0.20
MgO	11.30	9.57	12.14	10.28	10.91	12.42	12.43	12.24	12.48	12.45	12.47	12.43	12.15
CaO	0.22	0.17	0.08	0.23	0.07	0.05	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
Na_2O	0.18	0.16	0.21	0.15	0.17	0.19	0.08	0.09	0.08	0.09	0.10	0.08	0.09
K_2O	8.31	9.42	8.21	7.73	9.77	9.88	8.95	8.82	8.78	8.33	8.78	8.75	8.57
Cr_2O_3	0.01	*n.d.*	0.02	*n.d.*	*n.d.*	0.02	0.02	*n.d.*	0.05	*n.d.*	0.04	0.05	0.02
ZnO	0.04	0.05	*n.d.*	0.01	*n.d.*	*n.d.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.57	0.45	0.42	0.51	0.54	0.47	0.57	0.53	0.62	0.47	0.36	0.66	0.87
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	93.95	97.57	95.18	96.61	96.59	96.85	95.64	95.49	95.96	94.36	95.83	95.69	95.47
Oxygens	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Si	2.70	2.76	2.48	2.73	2.75	2.72	2.72	2.72	2.72	2.73	2.73	2.72	2.70
Ti	0.22	0.25	0.40	0.21	0.22	0.22	0.12	0.12	0.12	0.12	0.11	0.12	0.13
Al	1.48	1.43	1.33	1.45	1.44	1.42	1.47	1.49	1.48	1.46	1.48	1.48	1.52
Fe^{2+}	1.20	1.27	1.39	1.38	1.17	1.12	1.24	1.24	1.25	1.24	1.23	1.23	1.21
Mn	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	1.29	1.06	1.41	1.15	1.22	1.38	1.41	1.39	1.41	1.42	1.40	1.41	1.38
Ca	0.02	0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.03	0.02	0.03	0.02	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
K	0.81	0.90	0.82	0.74	0.93	0.94	0.87	0.85	0.85	0.81	0.85	0.85	0.83
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.02	0.01	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.03
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.77	7.73	7.88	7.72	7.79	7.85	7.87	7.85	7.86	7.83	7.85	7.86	7.83

Mineral	Biotite	Ilmenite/magnetite											
Sample	PNF 01B	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	bt_3.2	Op1.1 c1	Op1.1 c1	Op1.3 c1	Op1.4 c1	Op2.1 c1	Op2.2 c1	Op2.3 c1	Op2.4 c1	Op2.4 b1	Op3.1 c1	Op3.2 c1	Op3.2 b1
Rock type	Amphibolite	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	35.42	0.05	0.10	0.06	0.06	0.09	0.11	0.05	0.06	0.07	0.06	0.01	0.05
TiO_2	2.03	51.60	51.33	51.86	51.66	51.23	51.14	50.89	52.44	51.69	52.23	50.81	52.14
Al_2O_3	16.65	*n.d.*	*n.d.*	0.02	0.01	0.04	0.04	0.03	*n.d.*	0.02	0.02	0.02	*n.d.*
FeO (total)	18.51	47.83	47.65	47.59	48.09	47.57	47.74	48.01	48.17	47.71	47.67	47.90	48.40
MnO	0.13	*n.d.*	0.03	0.02	0.01	0.03	0.03	0.02	0.02	0.02	0.02	0.03	0.03
MgO	12.42	0.24	0.29	0.28	0.29	0.33	0.31	0.32	0.25	0.27	0.28	0.32	0.28
CaO	*n.d.*	*n.d.*	0.18	0.06	*n.d.*	0.10	0.03	0.03	0.02	0.06	0.01	*n.d.*	0.02
Na_2O	0.10	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.06	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
K_2O	8.20	*n.d.*	*n.d.*	0.03	0.04	0.01	*n.d.*	0.02	*n.d.*	0.07	*n.d.*	0.01	*n.d.*
Cr_2O_3	0.04	*n.d.*	*n.d.*	0.04	*n.d.*	0.01	0.03	*n.d.*	0.02	0.01	0.01	0.01	0.01
ZnO	*n.a.*	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	0.03	0.02	0.04	*n.d.*	0.03	*n.d.*
BaO	0.32	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	93.80	99.72	99.61	99.97	100.16	99.41	99.49	99.41	101.01	99.96	100.30	99.13	100.94
Oxygens	11.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Si	2.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ti	0.12	0.98	0.97	0.98	0.97	0.97	0.97	0.97	0.98	0.98	0.98	0.97	0.98
Al	1.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	1.19	0.99	0.97	0.98	0.98	0.97	0.97	0.97	0.99	0.98	0.99	0.97	0.98
Mn	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.42	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.02	0.03	0.02	0.03	0.03	0.04	0.04	0.01	0.02	0.01	0.04	0.03
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.81	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Mineral	Ilmenite/magnetite												
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Op3.3 b1	Op3.3 c1	Op3.4 c1	Op3.5 c1	Op4.1 c1	Op4.1 b1	Op4.2 b1	Op4.2 c1	Op5.1 c1	Op5.2 c1	Op5.3 c1	Op6 c1	Op8 b1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	0.10	0.03	0.08	0.05	0.06	0.02	0.07	0.08	0.04	0.02	0.06	0.12	0.09
TiO_2	53.12	51.73	51.36	51.94	51.86	51.63	52.16	51.10	51.71	52.16	51.65	52.51	52.44
Al_2O_3	0.04	0.03	*n.d.*	0.01	0.03	0.02	0.02	0.03	0.04	0.02	0.02	0.02	0.03
FeO (total)	47.61	48.16	48.42	47.38	48.26	48.18	48.07	48.41	48.06	48.08	48.23	47.63	47.06
MnO	0.03	0.02	0.04	0.01	0.01	0.04	0.04	0.03	*n.d.*	0.02	*n.d.*	0.02	0.03
MgO	0.26	0.26	0.26	0.42	0.30	0.35	0.26	0.30	0.37	0.40	0.40	0.46	0.23
CaO	0.05	0.01	*n.d.*	0.08	0.04	0.04	0.07	0.02	0.02	0.01	0.01	0.22	0.31
Na_2O	*n.d.*	*n.d.*	*n.d.*	0.01	0.01	*n.d.*	0.01	0.01	0.01	*n.d.*	*n.d.*	*n.d.*	0.03
K_2O	*n.d.*	0.04	0.03	0.03	0.03	0.02	0.01	*n.d.*	0.02	*n.d.*	0.01	0.01	0.02
Cr_2O_3	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	0.06	0.03	*n.d.*	0.04	*n.d.*	0.01	*n.d.*
ZnO	0.01	0.03	*n.d.*	*n.d.*	*n.d.*	0.06	*n.d.*	0.01	0.02	0.01	0.02	0.04	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.22	100.31	100.20	99.94	100.65	100.36	100.76	100.04	100.30	100.76	100.40	101.04	100.25
Oxygens	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ti	0.99	0.97	0.97	0.98	0.97	0.97	0.98	0.96	0.97	0.98	0.97	0.98	0.99
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.99	0.98	0.97	0.98	0.97	0.97	0.98	0.97	0.97	0.98	0.97	0.97	0.98
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.03	0.04	0.02	0.03	0.03	0.02	0.05	0.03	0.02	0.04	0.01	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Mineral						Ilmenite/magnetite							
Sample	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20	05 III 20
Anl code	Op8 b2	Op8 c1	Op8 b3	Op8 b4	Op8 b5	Op9.1 c1	Op9.2 c1	Op9.3 c1	Op9.4 c1	Op9.4 b1	Op9.5 c1	Op9.5 b1	Op9.6 c1
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	0.07	0.07	0.10	0.09	0.06	0.07	0.03	0.08	0.03	0.08	0.05	0.14	0.06
TiO_2	52.49	52.26	54.60	53.25	53.29	52.15	52.21	51.53	51.68	51.92	51.44	51.43	51.98
Al_2O_3	0.03	*n.d.*	0.06	0.04	0.03	0.02	*n.d.*	0.02	*n.d.*	0.03	0.03	0.03	0.04
FeO (total)	47.79	47.65	47.50	47.36	47.38	48.76	49.15	48.20	48.77	48.30	48.30	47.76	49.04
MnO	0.05	0.05	0.05	0.03	0.05	0.01	0.01	0.01	0.04	*n.d.*	0.04	0.02	0.02
MgO	0.30	0.28	0.29	0.25	0.25	0.25	0.20	0.20	0.20	0.22	0.14	0.17	0.22
CaO	0.11	*n.d.*	0.06	0.06	0.03	0.04	0.04	0.06	*n.d.*	0.02	0.07	0.35	0.02
Na_2O	*n.d.*	*n.d.*	0.01	0.02	0.01	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	0.03	0.02	*n.d.*
K_2O	0.01	0.03	*n.d.*	*n.d.*	0.02	0.04	*n.d.*	0.05	0.02	0.02	*n.d.*	0.02	0.02
Cr_2O_3	0.02	*n.d.*	0.04	0.03	*n.d.*	*n.d.*	0.03	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.03
ZnO	*n.d.*	0.01	*n.d.*	0.02	0.05	0.01	0.02	*n.d.*	*n.d.*	0.02	*n.d.*	0.01	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.87	100.35	102.70	101.15	101.17	101.35	101.69	100.15	100.75	100.60	100.09	99.95	101.45
Oxygens	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ti	0.98	0.98	1.00	0.99	0.99	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.99	0.99	0.97	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.97	0.97
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.01	0.01	0.00	0.00	0.00	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.04
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.00	2.00	1.99	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Mineral	Ilmenite/magnetite												
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Op3 1	Op3 2	Op3 3	Op4 1	Op4 2	Op4 3	Op5 1	Op5 2	Op5 3	Op5 4	Op6 1	Op6 2	Op6 3
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	0.08	0.09	0.05	0.07	0.07	0.03	0.06	0.03	0.06	0.06	0.07	0.10	0.06
TiO_2	53.55	53.89	54.50	52.37	53.13	53.20	54.11	52.59	54.24	53.58	52.63	52.24	52.60
Al_2O_3	0.01	0.01	0.01	*n.d.*	0.04	0.02	0.04	0.03	*n.d.*	*n.d.*	0.01	0.03	0.01
FeO (total)	45.53	45.94	45.38	46.23	46.14	46.17	45.89	45.25	45.19	46.38	46.61	46.98	46.34
MnO	0.03	0.04	0.02	0.06	0.03	0.04	0.01	0.03	0.02	0.03	0.04	0.03	0.03
MgO	0.13	0.16	0.12	0.26	0.24	0.23	0.27	0.26	0.32	0.25	0.17	0.27	0.30
CaO	0.08	0.03	0.03	*n.d.*	0.12	0.01	0.02	0.05	0.03	*n.d.*	0.07	0.07	0.10
Na_2O	0.02	*n.d.*	*n.d.*	0.02	0.02	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*
K_2O	0.03	0.01	0.03	0.01	*n.d.*	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.03	0.02	0.02
Cr_2O_3	0.02	*n.d.*	*n.d.*	*n.d.*	0.05	*n.d.*	0.01	0.01	0.02	*n.d.*	*n.d.*	0.01	0.01
ZnO	0.06	0.03	*n.d.*	0.04	*n.d.*	0.03	*n.d.*	*n.d.*	0.04	*n.d.*	*n.d.*	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.54	100.21	100.15	99.07	99.85	99.76	100.41	98.27	99.92	100.32	99.64	99.77	99.48
Oxygens	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ti	1.01	1.01	1.02	1.00	1.00	1.00	1.01	1.00	1.01	1.00	0.99	0.99	1.00
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.95	0.96	0.94	0.98	0.97	0.97	0.95	0.96	0.94	0.96	0.98	0.99	0.97
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.98	1.98	1.97	1.99	1.99	1.99	1.98	1.98	1.97	1.98	1.99	2.00	1.99

Mineral	Ilmenite/magnetite												
Sample	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A	09 VIII 8A
Anl code	Op7 1	Op7 2	Op7 3	Op8 1	Op8 2	Op8 3	Op8 4	Op9 1	Op9 2	Op9 3	Op10 1	Op10 2	Op10 3
Rock type	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	0.06	0.04	0.07	0.05	0.08	0.11	0.05	0.09	0.02	0.07	0.02	0.06	0.09
TiO_2	53.17	52.67	54.57	54.23	53.98	54.08	54.47	52.79	54.12	52.67	52.55	52.63	52.87
Al_2O_3	*n.d.*	0.01	0.04	0.03	0.01	0.03	0.03	0.05	0.01	0.03	0.03	0.02	0.04
FeO (total)	47.07	47.10	46.66	45.55	44.95	45.33	45.72	45.85	47.04	46.69	46.48	45.45	46.33
MnO	0.04	0.01	0.03	0.06	0.02	0.04	0.07	0.05	0.02	0.01	0.03	0.02	0.02
MgO	0.45	0.48	0.46	0.14	0.13	0.14	0.15	0.39	0.35	0.34	0.20	0.21	0.17
CaO	*n.d.*	0.01	0.04	0.04	0.03	0.06	*n.d.*	0.11	*n.d.*	0.02	0.05	0.04	0.11
Na_2O	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*
K_2O	0.01	*n.d.*	*n.d.*	0.02	0.03	0.03	0.03	0.01	*n.d.*	0.01	0.01	*n.d.*	0.01
Cr_2O_3	0.02	*n.d.*	0.03	*n.d.*	*n.d.*	0.03	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	0.01
ZnO	0.05	*n.d.*	0.01	0.01	0.06	0.01	0.02	0.05	0.03	0.04	0.01	0.01	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.86	100.33	101.92	100.13	99.31	99.87	100.52	99.41	101.60	99.90	99.38	98.45	99.68
Oxygens	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ti	0.99	0.99	1.00	1.01	1.02	1.01	1.01	1.00	1.00	0.99	1.00	1.00	1.00
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.98	0.98	0.95	0.95	0.94	0.94	0.95	0.96	0.97	0.98	0.98	0.96	0.97
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.02	0.02	0.02	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.00	2.00	1.98	1.98	1.97	1.97	1.97	1.99	1.99	2.00	1.99	1.98	1.99

Mineral							Ilmenite/magnetite						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Op2.1 c1	Op2.2 c1	Op2.3 c1	Op2.1 b1	Op2.4 c1	Op2.5 c1	Op3.1 c1	Op3.2 c1	Op3.3 c1	Op3.4 c1	Op3.5 c1	Op3.6 c1	Op3.7 c1
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	0.06	0.10	0.12	0.09	0.13	0.08	0.28	0.15	0.14	2.18	0.13	0.05	0.06
TiO_2	52.33	51.12	52.30	52.00	50.65	52.15	52.57	51.95	51.02	48.64	51.05	51.95	51.29
Al_2O_3	0.01	0.04	0.05	0.03	0.06	0.01	0.12	0.04	0.03	1.30	0.04	0.02	0.02
FeO (total)	47.49	47.88	47.59	47.93	48.08	47.29	47.67	47.02	47.45	46.06	47.11	47.21	46.95
MnO	0.02	0.02	0.04	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.01	0.03	0.04
MgO	0.13	0.35	0.37	0.34	0.29	0.33	0.38	0.27	0.25	0.31	0.26	0.25	0.28
CaO	0.03	0.12	0.19	0.01	0.14	0.04	0.10	0.11	0.11	0.43	0.16	0.06	0.03
Na_2O	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	0.05	*n.d.*	*n.d.*	0.03	0.01	*n.d.*	*n.d.*	0.02
K_2O	*n.d.*	0.01	0.02	0.02	*n.d.*	0.02	0.03	0.01	0.03	0.02	*n.d.*	*n.d.*	*n.d.*
Cr_2O_3	*n.d.*	0.04	*n.d.*	0.01	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*
ZnO	0.07	0.01	0.02	0.01	0.03	0.03	*n.d.*	0.04	0.01	*n.d.*	0.03	0.03	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.15	99.68	100.72	100.48	99.40	100.04	101.20	99.63	99.11	98.99	98.80	99.61	98.71
Oxygens	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Si	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.05	0.00	0.00	0.00
Ti	0.99	0.97	0.98	0.98	0.96	0.98	0.98	0.98	0.97	0.91	0.97	0.99	0.98
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
Fe^{2+}	1.00	0.97	0.97	0.98	0.96	0.98	0.98	0.99	0.97	0.96	0.98	0.99	0.98
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Ca	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.04	0.02	0.02	0.05	0.01	0.01	0.00	0.03	0.00	0.02	0.01	0.01
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Mineral							Ilmenite/magnetite						
Sample	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B	09 XII 8B
Anl code	Op4.1 c1	Op4.2 c1	Op4.3 c1	Op4.4 c1	Op5.1 c1	Op5.1 b1	Op5.2 c1	Op5.3 c1	Op5.4 c1	Op6 c1	Op7.1 c1	Op7.2 c1	Op7.3 c1
Rock type	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb	Fol metgb
SiO_2	0.09	0.07	0.09	0.05	0.07	0.15	0.07	0.08	0.06	0.10	0.14	0.07	0.12
TiO_2	51.23	51.78	52.15	52.78	52.53	51.59	52.01	52.05	52.32	51.10	50.98	52.30	53.11
Al_2O_3	0.01	0.02	0.03	0.02	0.03	0.06	0.05	0.03	0.04	0.04	0.07	0.04	0.02
FeO (total)	47.54	47.02	45.95	47.43	47.15	46.03	47.67	46.71	47.30	47.52	46.53	47.04	46.68
MnO	0.05	0.03	0.04	0.01	0.02	0.02	0.04	0.02	0.04	0.02	0.02	*n.d.*	0.04
MgO	0.34	0.32	0.32	0.22	0.23	0.18	0.26	0.25	0.22	0.77	0.32	0.34	0.35
CaO	0.04	0.04	0.10	0.03	0.08	0.11	0.17	0.03	0.12	0.11	0.12	0.10	0.20
Na_2O	0.03	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01
K_2O	0.01	*n.d.*	0.01	0.01	*n.d.*	0.03	0.02	*n.d.*	*n.d.*	*n.d.*	0.17	0.01	0.02
Cr_2O_3	0.02	*n.d.*	*n.d.*	0.04	0.01	0.05	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*
ZnO	*n.d.*	0.02	0.07	0.01	*n.d.*	0.09	0.04	0.01	*n.d.*	0.02	0.08	0.04	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.37	99.30	98.78	100.61	100.12	98.32	100.32	99.20	100.09	99.68	98.43	99.95	100.58
Oxygens	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ti	0.97	0.98	0.99	0.99	0.99	0.99	0.98	0.99	0.99	0.96	0.98	0.99	0.99
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.97	0.99	0.97	0.99	0.99	0.98	0.98	0.99	0.99	0.95	0.97	0.99	0.97
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.03	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.05	0.02	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.00	2.00	1.99	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.99

Mineral							Ilmenite/magnetite						
Sample	09 XII 8B	09 XII 8B	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A	PNF 01A
Anl code	Op7.4 c1	Op7.5 c1	Op1 1	Op1 2	Op2 1	Op2 2	Op3 1	Op5 1	Op5 2	Op5 3	Op7 1	Op7 2	Op7 3
Rock type	Fol metgb	Fol metgb	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro	Metagabbro
SiO_2	0.09	0.04	0.04	0.06	0.18	0.06	0.12	0.08	0.06	0.07	0.01	0.06	0.07
TiO_2	52.06	52.77	52.29	52.53	51.99	51.31	49.97	50.67	51.41	51.34	51.43	51.25	51.10
Al_2O_3	0.01	0.01	0.04	0.02	0.06	0.02	0.03	0.04	0.03	0.03	0.02	0.03	0.02
FeO (total)	46.54	47.00	49.68	48.43	47.79	48.83	48.88	49.79	48.58	49.09	48.67	49.63	49.02
MnO	0.06	0.02	0.03	0.03	0.03	0.02	0.01	0.02	*n.d.*	0.01	0.04	*n.d.*	0.03
MgO	0.38	0.41	0.37	0.34	0.52	0.50	0.42	0.48	0.45	0.39	0.35	0.35	0.38
CaO	0.08	0.01	0.01	*n.d.*	0.07	0.06	0.30	0.05	0.05	*n.d.*	0.02	0.02	0.04
Na_2O	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	0.01	*n.d.*	0.01	*n.d.*	*n.d.*
K_2O	*n.d.*	0.01	0.04	*n.d.*	0.02	0.02	0.02	*n.d.*	0.03	*n.d.*	*n.d.*	0.01	0.03
Cr_2O_3	0.01	*n.d.*	0.05	0.04	0.02	0.04	*n.d.*	0.07	0.04	0.02	0.06	*n.d.*	0.04
ZnO	0.04	0.02	0.01	0.01	0.01	0.03	0.05	*n.d.*	0.01	0.05	0.03	0.01	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.27	100.29	102.55	101.47	100.69	100.91	99.81	101.21	100.67	101.00	100.65	101.37	100.74
Oxygens	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ti	0.99	0.99	0.96	0.98	0.97	0.96	0.94	0.94	0.96	0.96	0.96	0.95	0.96
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.98	0.98	0.96	0.98	0.97	0.95	0.93	0.94	0.96	0.96	0.96	0.96	0.96
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.05	0.02	0.02	0.06	0.09	0.09	0.05	0.06	0.05	0.07	0.06
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Mineral				Ilmenite/magnetite				
Sample	PNF 01A	PNF 01A	PNF 01A	PNF 01B	PNF 01B	PNF 01B	PNF 01B	PNF 01B
Anl code	Op8 1	Op8 2	Op8 3	ilm_1.1	ilm_1.2	ilm_2.1	ilm_2.2	ilm_2.3
Rock type	Metagabbro	Metagabbro	Metagabbro	Amphibolite	Amphibolite	Amphibolite	Amphibolite	Amphibolite
SiO_2	0.06	0.05	0.02	0.02	0.02	0.01	*n.d.*	0.04
TiO_2	51.78	51.54	50.76	53.14	52.96	53.39	53.50	53.67
Al_2O_3	0.03	0.04	0.03	0.01	0.02	0.01	0.01	*n.d.*
FeO (total)	48.31	48.51	49.37	44.22	44.31	44.18	44.41	44.36
MnO	0.02	0.01	0.03	2.51	2.41	2.27	2.22	2.22
MgO	0.32	0.35	0.41	0.22	0.15	0.39	0.36	0.36
CaO	0.02	0.02	0.03	0.03	0.23	0.02	0.02	0.04
Na_2O	*n.d.*	*n.d.*	*n.d.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.d.*	0.02	*n.d.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	0.05	0.04	0.01	0.02	0.01	0.03	0.02
ZnO	*n.d.*	*n.d.*	0.01	0.03	0.02	*n.d.*	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.54	100.59	100.69	100.19	100.11	100.29	100.54	100.69
Oxygens	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ti	0.97	0.97	0.95	1.00	1.00	1.00	1.00	1.00
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.97	0.97	0.95	0.93	0.93	0.92	0.93	0.92
Mn	0.00	0.00	0.00	0.06	0.05	0.05	0.05	0.05
Mg	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Ca	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.03	0.04	0.08	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.00	2.00	2.00	2.00	2.00	1.99	1.99	1.99

APPENDIX B: ELECTRON MICROPROBE ANALYSIS OF MINERALS FROM METAMAFIC ROCKS FROM THE PASSOS *NAPPE* (CHAPTERS 4 AND 5)

The symbol Fe* denotes total Fe, which is FeO for all minerals, except epidote, for which Fe was considered as all Fe_2O_3. Fe^{3+} proportions were calculated stoichiometrically for clinopyroxene, garnet, ilmenite and amphibole. In the first three cases it was done using the method proposed by Droop (1987), while for amphibole the Schumacher method (described in Leake *et al.*, 1997) was used.

Mineral							Clinopyroxene						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Cpx 1.1	Cpx 1.2	Cpx 1.3	Cpx 1.4	Cpx 1.5	Cpx 1.6	Cpx 1.7	Cpx 1.8	Cpx 1.9	Cpx 2.1	Cpx 2.2	Cpx 2.3	Cpx 2.4
SiO_2	51.87	51.05	50.60	51.01	50.77	50.84	52.21	51.11	50.61	51.70	51.22	51.11	51.50
TiO_2	0.18	0.17	0.22	0.19	0.18	0.19	0.11	0.33	0.23	0.19	0.19	0.21	0.12
Al_2O_3	3.16	4.64	5.26	4.45	5.83	6.03	2.59	4.52	5.09	4.11	3.83	3.76	4.92
Fe*	9.12	9.55	9.30	9.38	9.19	9.13	9.13	9.41	9.50	8.84	9.28	9.58	9.03
MnO	0.08	0.10	0.11	0.12	0.12	0.12	0.11	0.11	0.11	0.09	0.10	0.12	0.11
MgO	11.89	11.16	10.82	11.05	10.63	10.51	12.06	11.10	10.86	11.41	11.43	11.25	11.11
CaO	22.34	22.10	21.90	22.21	21.26	21.30	22.77	22.15	22.15	21.72	22.43	22.55	21.36
Na_2O	1.07	1.26	1.20	1.24	1.65	1.70	0.93	1.12	1.33	1.38	1.09	1.06	1.69
K_2O	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*
Cr_2O_3	0.09	0.04	0.06	*n.d.*	*n.d.*	0.05	0.03	0.07	0.05	0.01	0.02	0.02	0.04
ZnO	*n.d.*	*n.d.*	0.01	*n.d.*	0.02	0.03	0.03	*n.d.*	0.02	*n.d.*	0.02	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.80	100.08	99.48	99.65	99.64	99.89	99.98	99.91	99.94	99.46	99.61	99.66	99.88
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.93	1.90	1.90	1.91	1.89	1.89	1.95	1.91	1.89	1.93	1.92	1.91	1.91
Ti	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00
Al	0.14	0.20	0.23	0.20	0.26	0.26	0.11	0.20	0.22	0.18	0.17	0.17	0.22
Fe^{2+}	0.22	0.21	0.23	0.21	0.21	0.21	0.22	0.24	0.20	0.22	0.21	0.22	0.19
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.66	0.62	0.60	0.62	0.59	0.58	0.67	0.62	0.60	0.64	0.64	0.63	0.61
Ca	0.89	0.88	0.88	0.89	0.85	0.85	0.91	0.89	0.88	0.87	0.90	0.90	0.85
Na	0.08	0.09	0.09	0.09	0.12	0.12	0.07	0.08	0.10	0.10	0.08	0.08	0.12
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.09	0.06	0.08	0.08	0.08	0.06	0.05	0.10	0.06	0.08	0.08	0.09
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Cpx 2.5	Cpx 2.6	Cpx 3.1	Cpx 3.2	Cpx 3.3	Cpx 3.4	Cpx 3.5	Cpx 3.6	Cpx 3.7	Cpx 3.9	Cpx 3.11	Cpx 4.1	Cpx 4.2
SiO_2	51.96	52.46	50.98	51.88	51.54	52.06	51.20	52.01	52.03	51.79	51.59	52.05	52.02
TiO_2	0.17	0.12	0.26	0.16	0.17	0.14	0.34	0.07	0.11	0.18	0.20	0.22	0.18
Al_2O_3	3.93	2.66	4.67	2.76	3.05	2.23	3.60	2.41	2.67	3.32	3.51	4.54	5.13
Fe*	9.03	9.24	8.95	8.77	8.86	8.98	9.21	9.03	8.98	8.85	8.52	7.96	7.59
MnO	0.09	0.09	0.09	0.10	0.10	0.09	0.10	0.12	0.09	0.11	0.07	0.11	0.09
MgO	11.41	12.13	11.26	12.01	11.91	12.25	11.69	12.29	12.07	11.96	12.08	11.91	11.65
CaO	21.89	22.44	21.79	22.79	22.92	23.15	22.78	22.79	22.51	22.32	22.36	21.94	20.97
Na_2O	1.43	1.00	1.46	1.04	0.96	0.77	1.06	0.92	1.02	1.15	1.26	1.38	1.92
K_2O	0.01	0.01	0.01	0.02	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	0.02	*n.d.*	*n.d.*	0.01
Cr_2O_3	0.04	0.07	0.19	0.10	0.08	0.09	0.03	0.03	0.05	0.04	0.03	0.03	0.10
ZnO	*n.d.*	0.03	*n.d.*	*n.d.*	0.03	0.04	0.01	*n.d.*	0.01	0.04	0.02	*n.d.*	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.97	100.25	99.66	99.63	99.62	99.79	100.02	99.70	99.55	99.78	99.65	100.14	99.67
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.93	1.95	1.90	1.94	1.93	1.95	1.91	1.94	1.95	1.93	1.92	1.92	1.92
Ti	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01
Al	0.17	0.12	0.21	0.12	0.13	0.10	0.16	0.11	0.12	0.15	0.15	0.20	0.22
Fe^{2+}	0.21	0.23	0.19	0.20	0.20	0.21	0.19	0.20	0.21	0.20	0.17	0.19	0.17
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.63	0.67	0.63	0.67	0.66	0.68	0.65	0.68	0.67	0.66	0.67	0.66	0.64
Ca	0.87	0.89	0.87	0.91	0.92	0.93	0.91	0.91	0.90	0.89	0.89	0.87	0.83
Na	0.10	0.07	0.11	0.08	0.07	0.06	0.08	0.07	0.07	0.08	0.09	0.10	0.14
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.06	0.09	0.08	0.08	0.07	0.09	0.08	0.07	0.08	0.10	0.05	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Cpx 4.3	Cpx 4.4	Cpx 4.5	Cpx 4.6	Cpx 4.7	Cpx 4.8	Cpx 4.9	Cpx 4.10	Cpx 4.11	Cpx 4.14	Cpx 4.15	Cpx 4.16	Cpx 5.1
SiO_2	51.84	52.40	52.40	52.33	51.66	52.18	51.90	51.73	52.08	52.46	52.27	51.93	52.01
TiO_2	0.31	0.20	0.27	0.19	0.25	0.18	0.24	0.15	0.17	0.25	0.20	0.27	0.13
Al_2O_3	3.65	2.93	4.05	5.51	4.37	3.71	4.42	4.45	3.23	3.08	3.49	3.72	3.46
Fe*	7.58	7.60	7.64	7.53	7.95	7.83	7.68	7.91	7.97	7.58	7.71	7.85	8.65
MnO	0.09	0.07	0.09	0.08	0.07	0.11	0.08	0.09	0.09	0.10	0.13	0.10	0.14
MgO	12.18	12.92	12.04	11.31	12.07	12.30	12.07	11.91	12.40	12.71	12.48	12.20	12.07
CaO	22.28	22.51	22.36	20.43	21.91	22.36	22.10	22.01	22.85	22.79	22.62	22.61	22.65
Na_2O	1.27	1.25	1.42	2.16	1.55	1.35	1.45	1.46	1.06	1.20	1.13	1.16	1.18
K_2O	0.01	0.01	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.02	*n.d.*	0.01	*n.d.*
Cr_2O_3	0.03	0.06	0.12	0.03	0.04	0.04	0.02	0.03	0.05	0.11	0.08	*n.d.*	0.07
ZnO	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	0.04	0.02	0.01	0.04	*n.d.*	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.24	99.94	100.43	99.57	99.88	100.05	100.00	99.76	99.92	100.34	100.11	99.85	100.36
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.93	1.94	1.93	1.93	1.91	1.93	1.92	1.92	1.93	1.93	1.93	1.93	1.92
Ti	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.00
Al	0.16	0.13	0.18	0.24	0.19	0.16	0.19	0.19	0.14	0.13	0.15	0.16	0.15
Fe^{2+}	0.18	0.15	0.18	0.19	0.15	0.16	0.16	0.17	0.18	0.16	0.18	0.18	0.18
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.68	0.71	0.66	0.62	0.67	0.68	0.66	0.66	0.69	0.70	0.69	0.67	0.67
Ca	0.89	0.89	0.88	0.81	0.87	0.89	0.87	0.87	0.91	0.90	0.90	0.90	0.90
Na	0.09	0.09	0.10	0.15	0.11	0.10	0.10	0.10	0.08	0.09	0.08	0.08	0.08
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.06	0.09	0.06	0.05	0.10	0.08	0.07	0.08	0.07	0.08	0.06	0.06	0.09
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Cpx 5.2	Cpx 5.4	Cpx 5.5	Cpx 5.6	Cpx 5.7	Cpx 5.8	Cpx 5.9	Cpx 5.10	Cpx 5.11	Cpx 5.12	Cpx 5.13	Cpx 5.14	Cpx 5.15
SiO_2	50.99	52.27	52.58	51.95	50.85	50.84	51.65	52.42	52.27	52.57	52.82	52.14	52.53
TiO_2	0.17	0.18	0.14	0.14	0.17	0.33	0.23	0.17	0.13	0.11	0.19	0.19	0.19
Al_2O_3	4.30	2.59	2.77	3.09	6.01	6.17	4.47	3.23	4.15	2.13	2.87	3.67	3.04
Fe*	8.81	8.37	8.45	8.73	8.26	8.33	8.38	8.45	8.08	8.23	8.12	8.45	8.16
MnO	0.10	0.12	0.11	0.13	0.09	0.11	0.10	0.10	0.09	0.10	0.09	0.11	0.11
MgO	11.70	12.60	12.54	11.92	11.15	10.93	11.76	12.24	11.90	12.71	12.57	12.07	12.35
CaO	21.96	23.02	22.73	23.02	22.74	21.71	21.97	22.48	21.80	22.95	22.30	22.23	22.53
Na_2O	1.25	0.87	0.99	0.97	0.91	1.56	1.28	1.11	1.55	0.82	1.28	1.16	0.99
K_2O	*n.d.*	0.01	*n.d.*	0.02	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	0.01	*n.d.*
Cr_2O_3	0.05	0.04	*n.d.*	0.06	0.09	0.07	*n.d.*	0.05	0.09	0.07	0.05	0.07	0.04
ZnO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	0.01	*n.d.*	*n.d.*	0.02	0.02	0.05
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.32	100.08	100.31	100.02	100.27	100.07	99.85	100.26	100.06	99.70	100.32	100.12	100.00
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.91	1.94	1.95	1.93	1.89	1.88	1.92	1.94	1.93	1.96	1.95	1.93	1.95
Ti	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01
Al	0.19	0.11	0.12	0.14	0.26	0.27	0.20	0.14	0.18	0.09	0.12	0.16	0.13
Fe^{2+}	0.19	0.19	0.20	0.20	0.23	0.19	0.20	0.21	0.18	0.21	0.18	0.21	0.22
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.65	0.70	0.69	0.66	0.62	0.60	0.65	0.68	0.66	0.71	0.69	0.67	0.68
Ca	0.88	0.92	0.90	0.92	0.90	0.86	0.87	0.89	0.86	0.92	0.88	0.88	0.90
Na	0.09	0.06	0.07	0.07	0.07	0.11	0.09	0.08	0.11	0.06	0.09	0.08	0.07
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.09	0.07	0.06	0.07	0.03	0.07	0.06	0.06	0.07	0.05	0.07	0.06	0.04
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Cpx 6.1	Cpx 6.2	Cpx 6.3	Cpx 6.4	Cpx 6.5	Cpx 6.6	Cpx 6.7	Cpx 6.8	Cpx 6.9	Cpx 6.10	Cpx 6.11	Cpx 6.12	Cpx 6.14
SiO_2	52.54	52.53	52.15	51.95	51.63	51.77	51.95	52.37	50.72	51.94	50.07	52.41	51.87
TiO_2	0.12	0.11	0.19	0.23	0.23	0.22	0.10	0.17	0.27	0.18	0.31	0.14	0.06
Al_2O_3	2.25	2.78	3.20	3.32	3.86	4.38	3.66	2.80	4.04	3.23	5.09	2.36	3.59
Fe*	8.17	8.61	8.74	8.61	8.57	8.55	8.54	8.55	9.62	8.61	8.92	8.68	8.57
MnO	0.10	0.11	0.08	0.07	0.10	0.10	0.10	0.10	0.10	0.11	0.08	0.08	0.13
MgO	12.60	12.28	12.10	12.10	11.91	11.54	12.00	12.44	10.92	12.26	11.00	12.33	11.93
CaO	23.16	22.48	22.56	22.35	22.39	22.17	22.34	22.88	20.33	22.75	21.26	22.58	22.44
Na_2O	0.88	1.09	1.03	1.16	1.09	1.28	1.15	0.97	1.32	0.92	1.37	0.81	1.15
K_2O	0.01	0.01	0.01	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	0.02	0.01	0.05	0.04	*n.d.*
Cr_2O_3	*n.d.*	0.03	0.06	0.11	0.10	0.10	0.07	*n.d.*	0.02	0.04	0.10	0.13	0.02
ZnO	*n.d.*	0.01	*n.d.*	0.05	0.01	0.02	0.03	0.01	*n.d.*	*n.d.*	0.03	0.02	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.84	100.03	100.12	99.94	99.88	100.15	99.95	100.29	97.36	100.05	98.28	99.58	99.78
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.95	1.95	1.94	1.93	1.92	1.92	1.93	1.94	1.94	1.93	1.89	1.96	1.93
Ti	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00
Al	0.10	0.12	0.14	0.15	0.17	0.19	0.16	0.12	0.18	0.14	0.23	0.10	0.16
Fe^{2+}	0.19	0.21	0.21	0.20	0.20	0.21	0.20	0.20	0.28	0.20	0.20	0.24	0.19
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.70	0.68	0.67	0.67	0.66	0.64	0.66	0.69	0.62	0.68	0.62	0.69	0.66
Ca	0.92	0.89	0.90	0.89	0.89	0.88	0.89	0.91	0.83	0.91	0.86	0.90	0.89
Na	0.06	0.08	0.07	0.08	0.08	0.09	0.08	0.07	0.10	0.07	0.10	0.06	0.08
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.06	0.06	0.06	0.07	0.06	0.06	0.07	0.07	0.03	0.06	0.08	0.03	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Cpx 7.1	Cpx 7.2	Cpx 7.3	Cpx 7.4	Cpx 7.5	Cpx 7.6	Cpx 7.7	Cpx 7.8	Cpx 7.9	Cpx 7.10	Cpx 7.11	Cpx 8.1	Cpx 8.2
SiO_2	52.06	51.90	52.30	52.44	52.44	51.81	52.16	52.12	52.95	51.97	53.18	52.25	52.62
TiO_2	0.13	0.20	0.15	0.12	0.13	0.17	0.18	0.24	0.21	0.16	0.05	0.13	0.14
Al_2O_3	5.48	3.52	3.41	2.45	2.55	3.89	3.87	4.62	2.38	3.62	1.20	4.04	3.28
Fe*	7.93	8.43	8.18	8.35	8.17	8.05	7.91	7.79	7.85	8.03	7.60	7.64	7.32
MnO	0.10	0.12	0.11	0.09	0.13	0.11	0.11	0.08	0.09	0.09	0.10	0.07	0.09
MgO	11.31	12.26	12.26	12.75	12.77	12.12	12.16	11.97	12.92	12.29	13.59	12.25	12.65
CaO	20.82	22.59	21.89	22.69	22.83	22.48	22.16	21.44	22.58	22.59	23.83	21.84	22.31
Na_2O	1.89	1.08	1.36	1.03	1.17	1.27	1.37	1.62	0.95	1.22	0.45	1.49	1.39
K_2O	0.01	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
Cr_2O_3	0.03	0.03	0.05	0.13	0.01	*n.d.*	0.07	0.07	0.12	0.02	0.02	0.06	0.06
ZnO	0.01	*n.d.*	0.04	0.02	0.04	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.76	100.14	99.75	100.09	100.24	99.93	100.01	99.95	100.06	100.00	100.03	99.77	99.85
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.92	1.92	1.94	1.94	1.94	1.92	1.93	1.92	1.96	1.92	1.97	1.93	1.94
Ti	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Al	0.24	0.15	0.15	0.11	0.11	0.17	0.17	0.20	0.10	0.16	0.05	0.18	0.14
Fe^{2+}	0.20	0.19	0.19	0.18	0.15	0.17	0.17	0.18	0.21	0.17	0.20	0.17	0.16
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.62	0.68	0.68	0.70	0.70	0.67	0.67	0.66	0.71	0.68	0.75	0.68	0.70
Ca	0.82	0.90	0.87	0.90	0.90	0.89	0.88	0.85	0.90	0.90	0.95	0.87	0.88
Na	0.14	0.08	0.10	0.07	0.08	0.09	0.10	0.12	0.07	0.09	0.03	0.11	0.10
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.05	0.08	0.07	0.08	0.10	0.08	0.07	0.06	0.03	0.08	0.04	0.07	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Cpx 8.3	Cpx 8.4	Cpx 8.5	Cpx 8.6	Cpx 8.7	Cpx 8.8	Cpx 8.9	Cpx 8.10	Cpx 8.11	Cpx 1.1	Cpx 1.2	Cpx 1.3	Cpx 1.4
SiO_2	51.64	51.75	52.12	52.44	52.46	52.81	52.08	52.77	51.65	49.30	52.45	52.54	52.59
TiO_2	0.22	0.20	0.21	0.20	0.18	0.15	0.24	0.14	0.17	0.32	0.06	0.13	0.09
Al_2O_3	5.15	3.97	5.16	3.05	3.43	1.84	5.56	3.11	4.55	5.93	2.47	2.14	2.50
Fe*	7.97	7.87	7.36	7.53	7.47	7.86	7.71	7.87	8.03	9.91	8.14	7.87	8.10
MnO	0.09	0.11	0.07	0.07	0.07	0.09	0.08	0.10	0.08	0.06	0.11	0.10	0.08
MgO	11.65	12.25	11.83	12.76	12.68	13.37	11.30	12.67	11.81	12.56	12.93	13.08	12.63
CaO	21.61	21.84	20.70	22.08	22.03	23.33	20.81	22.31	22.13	18.87	22.94	23.67	22.70
Na_2O	1.55	1.48	2.05	1.34	1.53	0.81	1.89	1.25	1.49	1.10	0.81	0.83	0.94
K_2O	*n.d.*	0.02	0.01	0.02	*n.d.*	0.01	0.01	*n.d.*	*n.d.*	0.28	0.03	*n.d.*	0.03
Cr_2O_3	0.06	0.03	0.03	0.08	0.05	0.03	0.04	0.05	*n.d.*	0.08	0.08	0.04	0.05
ZnO	*n.d.*	*n.d.*	0.04	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	0.01	*n.d.*	*n.d.*	0.01	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.94	99.52	99.58	99.56	99.90	100.31	99.73	100.27	99.92	98.41	100.02	100.41	99.72
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.91	1.92	1.92	1.94	1.93	1.95	1.93	1.95	1.91	1.85	1.95	1.94	1.96
Ti	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00
Al	0.22	0.17	0.22	0.13	0.15	0.08	0.24	0.14	0.20	0.26	0.11	0.09	0.11
Fe^{2+}	0.18	0.15	0.15	0.16	0.14	0.16	0.20	0.18	0.16	0.20	0.19	0.16	0.20
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.64	0.68	0.65	0.71	0.70	0.74	0.62	0.70	0.65	0.70	0.72	0.72	0.70
Ca	0.86	0.87	0.82	0.88	0.87	0.92	0.82	0.88	0.88	0.76	0.91	0.94	0.91
Na	0.11	0.11	0.15	0.10	0.11	0.06	0.14	0.09	0.11	0.08	0.06	0.06	0.07
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.06	0.09	0.07	0.07	0.09	0.08	0.04	0.06	0.09	0.11	0.06	0.09	0.05
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral	Clinopyroxene												
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Cpx 1.5	Cpx 1.6	Cpx 1.7	Cpx 1.8	Cpx 1.9	Cpx 1.10	Cpx 1.12	Cpx 1.13	Cpx 1.14	Cpx 1.15	Cpx 1.16	Cpx 1.18	Cpx 1.19
SiO_2	52.34	52.13	51.84	51.58	51.66	52.11	52.40	51.48	52.59	52.30	51.80	52.58	52.08
TiO_2	0.13	0.14	0.16	0.17	0.13	0.14	0.17	0.17	0.05	0.04	0.19	0.12	0.13
Al_2O_3	2.67	2.18	3.16	3.21	3.17	3.24	3.22	3.53	2.40	2.80	3.34	2.32	2.81
Fe*	7.98	7.90	8.27	8.27	8.08	7.95	8.05	8.15	8.16	8.19	8.27	8.02	8.27
MnO	0.10	0.10	0.11	0.11	0.09	0.09	0.09	0.12	0.09	0.11	0.11	0.11	0.08
MgO	12.61	12.81	12.34	12.33	12.28	12.30	12.35	12.15	12.85	12.46	12.29	12.69	12.58
CaO	22.91	23.40	22.95	22.70	23.18	22.63	22.69	22.76	22.93	22.63	22.65	23.00	22.96
Na_2O	0.90	0.78	0.90	1.12	0.97	0.96	1.19	1.08	0.89	1.04	1.06	0.85	1.02
K_2O	*n.d.*	0.02	0.01	0.01	0.01	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.02
Cr_2O_3	0.05	0.09	0.04	0.02	0.11	0.01	0.07	*n.d.*	0.10	0.02	0.07	0.02	*n.d.*
ZnO	0.03	*n.d.*	0.04	*n.d.*	*n.d.*	*n.d.*	0.01	0.01	0.02	0.01	0.04	*n.d.*	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.73	99.55	99.82	99.52	99.69	99.46	100.24	99.46	100.08	99.60	99.82	99.73	99.98
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.95	1.94	1.93	1.92	1.92	1.94	1.94	1.92	1.95	1.95	1.93	1.96	1.93
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Al	0.12	0.10	0.14	0.14	0.14	0.14	0.14	0.16	0.10	0.12	0.15	0.10	0.12
Fe^{2+}	0.19	0.17	0.19	0.16	0.17	0.21	0.18	0.17	0.19	0.19	0.18	0.20	0.16
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.70	0.71	0.68	0.68	0.68	0.68	0.68	0.68	0.71	0.69	0.68	0.70	0.70
Ca	0.91	0.93	0.91	0.91	0.92	0.90	0.90	0.91	0.91	0.90	0.90	0.92	0.91
Na	0.07	0.06	0.07	0.08	0.07	0.07	0.09	0.08	0.06	0.07	0.08	0.06	0.07
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.05	0.07	0.07	0.10	0.09	0.04	0.07	0.08	0.06	0.06	0.08	0.05	0.09
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Cpx 1.20	Cpx 1.21	Cpx 1.22	Cpx 2.2	Cpx 2.3	Cpx 2.4	Cpx 2.5	Cpx 2.6	Cpx 2.7	Cpx 2.8	Cpx 2.9	Cpx 2.10	Cpx 2.11
SiO_2	51.19	51.76	52.09	53.05	52.10	53.23	52.92	52.51	52.81	52.30	52.81	52.90	52.60
TiO_2	0.16	0.16	0.19	0.17	0.18	0.14	0.16	0.22	0.13	0.17	0.15	0.04	0.18
Al_2O_3	3.26	3.16	3.57	2.38	4.73	2.68	3.98	3.57	3.14	3.84	3.75	2.23	3.51
Fe*	8.05	8.20	7.89	7.11	6.90	6.73	6.84	6.93	6.65	6.77	6.69	6.75	7.01
MnO	0.10	0.08	0.10	0.05	0.09	0.09	0.06	0.06	0.05	0.09	0.05	0.09	0.08
MgO	12.24	12.26	12.48	13.71	12.43	13.44	12.70	12.97	13.12	12.90	12.80	13.58	12.95
CaO	22.37	23.01	22.38	23.14	22.19	22.88	21.65	22.27	21.79	22.54	21.81	23.34	22.66
Na_2O	0.92	0.93	1.22	0.87	1.42	0.95	1.65	1.23	1.40	1.16	1.42	0.81	1.28
K_2O	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	0.02
Cr_2O_3	0.01	0.01	0.06	0.06	0.01	0.05	0.07	0.01	0.08	0.09	0.06	0.09	0.05
ZnO	*n.d.*	0.02	0.03	*n.d.*	0.04	0.01	*n.d.*	0.01	0.01	0.04	*n.d.*	0.02	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.31	99.61	100.02	100.53	100.08	100.21	100.03	99.79	99.20	99.90	99.54	99.84	100.37
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.93	1.93	1.93	1.95	1.92	1.96	1.94	1.94	1.96	1.93	1.95	1.96	1.93
Ti	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Al	0.15	0.14	0.16	0.10	0.21	0.12	0.17	0.16	0.14	0.17	0.16	0.10	0.15
Fe^{2+}	0.20	0.18	0.17	0.16	0.15	0.17	0.15	0.16	0.16	0.15	0.17	0.15	0.14
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.69	0.68	0.69	0.75	0.68	0.74	0.70	0.71	0.72	0.71	0.71	0.75	0.71
Ca	0.90	0.92	0.89	0.91	0.87	0.90	0.85	0.88	0.87	0.89	0.86	0.92	0.89
Na	0.07	0.07	0.09	0.06	0.10	0.07	0.12	0.09	0.10	0.08	0.10	0.06	0.09
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.06	0.07	0.08	0.06	0.06	0.03	0.06	0.05	0.05	0.05	0.03	0.05	0.08
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral	Clinopyroxene												
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Cpx 2.12	Cpx 2.13	Cpx 2.14	Cpx 2.15	Cpx 2.16	Cpx 3.1	Cpx 3.2	Cpx 3.3	Cpx 3.4	Cpx 3.5	Cpx 3.7	Cpx 3.8	Cpx 3.9
SiO_2	52.28	52.65	51.30	51.96	52.09	52.27	52.39	52.24	52.86	51.91	52.49	51.23	52.05
TiO_2	0.21	0.08	0.17	0.17	0.09	0.14	0.16	0.20	0.05	0.15	0.11	0.13	0.19
Al_2O_3	3.02	2.43	6.23	3.51	2.35	2.49	4.06	4.55	4.09	5.20	3.41	5.66	3.91
Fe*	6.85	7.09	6.99	6.94	6.94	7.17	7.29	6.90	6.61	7.14	7.48	7.61	7.53
MnO	0.07	0.06	0.11	0.07	0.05	0.14	0.11	0.08	0.09	0.12	0.15	0.16	0.11
MgO	13.09	13.52	11.36	12.92	13.49	13.23	12.62	12.71	12.68	11.91	12.67	11.43	12.34
CaO	22.60	23.12	21.18	22.25	23.11	22.57	22.41	22.02	21.94	21.73	22.51	21.56	22.20
Na_2O	1.23	1.07	2.02	1.22	0.95	1.01	1.19	1.34	1.44	1.57	1.15	1.51	1.27
K_2O	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	*n.d.*	*n.d.*	0.01	0.01
Cr_2O_3	0.01	0.06	0.02	0.05	*n.d.*	*n.d.*	*n.d.*	0.01	0.01	0.03	0.04	*n.d.*	0.03
ZnO	0.01	*n.d.*	0.02	0.04	0.02	0.02	0.02	0.05	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.38	100.09	99.39	99.12	99.08	99.05	100.26	100.14	99.77	99.77	100.00	99.30	99.65
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.94	1.94	1.90	1.93	1.94	1.95	1.93	1.92	1.95	1.92	1.94	1.90	1.93
Ti	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
Al	0.13	0.11	0.27	0.15	0.10	0.11	0.18	0.20	0.18	0.23	0.15	0.25	0.17
Fe^{2+}	0.13	0.12	0.13	0.15	0.12	0.15	0.17	0.15	0.17	0.17	0.17	0.18	0.17
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.72	0.74	0.63	0.72	0.75	0.74	0.69	0.70	0.70	0.66	0.70	0.63	0.68
Ca	0.90	0.91	0.84	0.89	0.92	0.90	0.88	0.87	0.87	0.86	0.89	0.86	0.88
Na	0.09	0.08	0.14	0.09	0.07	0.07	0.08	0.10	0.10	0.11	0.08	0.11	0.09
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.08	0.10	0.08	0.07	0.09	0.07	0.05	0.06	0.04	0.05	0.06	0.05	0.06
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Cpx 3.10	Cpx 3.11	Cpx 3.12	Cpx 3.14	Cpx 3.15	Cpx 3.16	Cpx 3.17	Cpx 3.18	Cpx 3.19	Cpx 3.21	Cpx 3.22	Cpx 3.23	Cpx 3.24
SiO_2	52.33	52.58	52.08	51.96	52.46	52.57	52.97	52.15	52.08	49.21	51.98	52.65	51.90
TiO_2	0.08	0.14	0.20	0.21	0.24	0.12	0.15	0.23	0.14	0.23	0.05	0.14	0.10
Al_2O_3	2.69	3.12	2.84	3.58	2.81	2.60	2.78	3.20	3.19	5.95	3.66	2.70	3.31
Fe*	7.97	7.97	8.11	7.88	8.08	7.77	7.28	7.57	7.99	11.07	7.76	7.73	7.96
MnO	0.15	0.16	0.15	0.17	0.16	0.12	0.12	0.12	0.12	0.13	0.12	0.14	0.13
MgO	12.94	12.61	12.67	12.49	12.57	12.99	13.16	12.70	13.06	13.00	12.43	12.91	12.60
CaO	22.72	22.44	22.77	21.93	22.90	22.75	22.65	22.73	22.00	17.83	22.33	22.69	22.83
Na_2O	1.08	1.10	0.94	1.14	0.94	0.99	1.10	1.10	1.01	1.01	1.21	0.90	0.98
K_2O	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	0.02	*n.d.*	0.01	0.06	0.22	*n.d.*	0.01	*n.d.*
Cr_2O_3	0.08	0.03	0.03	0.03	*n.d.*	0.06	0.01	0.04	*n.d.*	0.07	*n.d.*	0.03	0.05
ZnO	0.01	*n.d.*	0.01	0.02	*n.d.*	0.02	*n.d.*	*n.d.*	0.02	0.02	0.04	0.01	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.04	100.14	99.80	99.42	100.17	100.01	100.21	99.86	99.68	98.73	99.58	99.91	99.88
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.94	1.94	1.94	1.93	1.94	1.95	1.95	1.93	1.93	1.85	1.93	1.95	1.92
Ti	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Al	0.12	0.14	0.12	0.16	0.12	0.11	0.12	0.14	0.14	0.26	0.16	0.12	0.14
Fe^{2+}	0.15	0.19	0.18	0.19	0.20	0.17	0.17	0.16	0.17	0.23	0.17	0.20	0.17
Mn	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.71	0.70	0.70	0.69	0.69	0.72	0.72	0.70	0.72	0.73	0.69	0.71	0.70
Ca	0.90	0.89	0.91	0.87	0.91	0.90	0.89	0.90	0.87	0.72	0.89	0.90	0.91
Na	0.08	0.08	0.07	0.08	0.07	0.07	0.08	0.08	0.07	0.07	0.09	0.06	0.07
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.09	0.05	0.07	0.05	0.05	0.07	0.06	0.07	0.07	0.12	0.07	0.04	0.08
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Cpx 3.26	Cpx 3.27	Cpx 3.29	Cpx 3.30	Cpx 4.1	Cpx 4.2	Cpx 4.3	Cpx 4.4	Cpx 4.5	Cpx 4.6	Cpx 4.7	Cpx 4.8	Cpx 4.9
SiO_2	52.56	52.22	50.19	51.91	51.78	52.32	52.25	52.00	52.93	52.23	52.67	52.12	51.93
TiO_2	0.02	0.08	0.25	0.09	0.15	0.11	0.16	0.04	0.11	0.16	0.15	0.15	0.12
Al_2O_3	2.67	2.59	5.20	3.00	4.26	3.40	3.56	2.79	2.48	3.92	3.02	3.12	3.50
Fe*	7.34	7.39	9.65	8.10	7.51	7.78	7.87	7.52	7.73	7.25	7.93	8.15	8.13
MnO	0.14	0.14	0.14	0.12	0.15	0.16	0.13	0.17	0.14	0.13	0.15	0.16	0.14
MgO	13.18	13.17	12.63	12.61	12.30	12.44	12.46	12.83	13.07	12.49	12.63	12.50	12.16
CaO	22.58	22.90	18.82	22.71	22.09	22.41	22.25	22.41	22.46	22.38	21.92	22.30	22.40
Na_2O	1.08	1.00	0.98	1.02	1.32	1.09	1.22	1.18	0.97	1.32	1.23	1.21	1.15
K_2O	*n.d.*	0.03	0.16	0.01	*n.d.*	*n.d.*	0.01	*n.d.*	0.01	0.01	0.01	0.02	*n.d.*
Cr_2O_3	0.03	0.02	0.03	0.01	*n.d.*	0.03	0.05	0.03	*n.d.*	0.05	0.05	0.08	0.07
ZnO	0.02	*n.d.*	*n.d.*	0.01	*n.d.*	0.01	0.05	0.04	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.04
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.62	99.54	98.05	99.59	99.56	99.75	100.01	99.01	99.90	99.94	99.76	99.81	99.64
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.95	1.94	1.90	1.93	1.92	1.94	1.93	1.94	1.96	1.93	1.95	1.93	1.93
Ti	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	0.12	0.11	0.23	0.13	0.19	0.15	0.16	0.12	0.11	0.17	0.13	0.14	0.15
Fe^{2+}	0.15	0.14	0.26	0.17	0.16	0.19	0.18	0.14	0.20	0.16	0.20	0.17	0.19
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Mg	0.73	0.73	0.71	0.70	0.68	0.69	0.69	0.71	0.72	0.69	0.70	0.69	0.67
Ca	0.90	0.91	0.76	0.91	0.88	0.89	0.88	0.90	0.89	0.89	0.87	0.89	0.89
Na	0.08	0.07	0.07	0.07	0.09	0.08	0.09	0.09	0.07	0.09	0.09	0.09	0.08
K	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.09	0.05	0.08	0.07	0.05	0.07	0.09	0.04	0.07	0.05	0.08	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral	Clinopyroxene												
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Cpx 4.10	Cpx 4.11	Cpx 4.12	Cpx 4.13	Cpx 4.14	Cpx 4.15	Cpx 4.16	Cpx 4.17	Cpx 4.18	Cpx 4.19	Cpx 4.20	Cpx 4.21	Cpx 4.25
SiO_2	52.18	52.32	52.39	51.79	52.42	51.94	52.70	51.14	51.97	52.59	53.04	52.68	48.99
TiO_2	0.17	0.18	0.17	0.20	0.17	0.26	0.07	0.12	0.15	0.09	0.13	0.05	0.37
Al_2O_3	4.57	3.98	3.27	2.97	3.70	3.60	2.94	4.44	3.67	2.47	3.24	2.59	6.59
Fe*	6.89	7.08	7.05	6.93	6.98	7.54	6.80	8.19	7.65	7.59	6.63	7.11	10.36
MnO	0.09	0.04	0.06	0.08	0.11	0.14	0.10	0.17	0.14	0.16	0.09	0.12	0.08
MgO	12.36	12.65	13.05	13.01	12.84	12.55	13.25	11.68	12.55	12.96	13.25	13.34	14.09
CaO	21.80	22.27	22.59	22.33	22.02	22.40	22.38	21.76	22.06	22.63	22.66	23.07	14.50
Na_2O	1.55	1.35	1.17	1.14	1.34	1.17	1.16	1.40	1.26	0.98	1.27	0.99	0.92
K_2O	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.35
Cr_2O_3	0.06	0.05	0.06	0.08	0.04	0.02	0.06	*n.d.*	0.02	0.06	0.05	0.07	0.15
ZnO	0.02	*n.d.*	0.04	0.01	0.01	0.02	0.04	*n.d.*	0.03	0.04	0.03	0.02	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.71	99.92	99.85	98.53	99.63	99.66	99.49	98.91	99.51	99.56	100.39	100.04	96.42
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.93	1.93	1.93	1.94	1.94	1.93	1.95	1.91	1.93	1.96	1.94	1.94	1.87
Ti	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Al	0.20	0.17	0.14	0.13	0.16	0.16	0.13	0.20	0.16	0.11	0.14	0.11	0.30
Fe^{2+}	0.15	0.15	0.15	0.14	0.16	0.17	0.15	0.17	0.16	0.18	0.14	0.14	0.31
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Mg	0.68	0.70	0.72	0.73	0.71	0.69	0.73	0.65	0.69	0.72	0.72	0.73	0.80
Ca	0.86	0.88	0.89	0.90	0.87	0.89	0.89	0.87	0.88	0.90	0.89	0.91	0.59
Na	0.11	0.10	0.08	0.08	0.10	0.08	0.08	0.10	0.09	0.07	0.09	0.07	0.07
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.06	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.06	0.08	0.03
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral	Clinopyroxene												
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Cpx 4.26	Cpx 4.27	Cpx 4.30	Cpx 5.2	Cpx 5.3	Cpx 5.4	Cpx 5.5	Cpx 5.6	Cpx 5.7	Cpx 5.8	Cpx 5.9	Cpx 5.10	Cpx 5.11
SiO_2	52.68	52.62	52.38	51.63	51.99	52.67	51.55	53.06	52.17	52.14	52.57	52.37	51.60
TiO_2	0.17	0.13	0.13	0.20	0.11	0.11	0.05	0.10	0.18	0.22	0.13	0.16	0.04
Al_2O_3	4.13	3.64	3.75	5.27	5.48	5.51	5.53	4.96	4.94	5.16	4.66	5.11	4.02
Fe*	7.08	7.01	7.19	8.11	7.86	7.86	8.17	7.54	8.52	7.19	7.06	7.12	7.48
MnO	0.09	0.09	0.09	0.18	0.16	0.13	0.11	0.10	0.09	0.05	0.06	0.05	0.06
MgO	12.56	12.73	12.60	11.38	11.13	11.16	10.99	11.44	11.93	11.59	11.95	11.76	12.67
CaO	21.94	21.96	21.93	20.65	20.48	19.73	19.44	19.68	19.06	20.37	21.10	20.95	21.03
Na_2O	1.60	1.46	1.47	2.09	2.21	2.61	2.24	2.60	2.17	2.42	2.11	2.09	1.33
K_2O	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	0.02	0.01	*n.d.*	0.01	*n.d.*	0.02
Cr_2O_3	0.05	0.04	0.06	0.06	0.02	0.03	0.09	*n.d.*	*n.d.*	0.04	0.08	0.03	0.04
ZnO	0.01	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	0.02	0.02	*n.d.*	0.03	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.30	99.68	99.61	99.58	99.43	99.81	98.19	99.51	99.09	99.19	99.72	99.66	98.31
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.93	1.94	1.94	1.91	1.92	1.94	1.93	1.95	1.94	1.93	1.93	1.93	1.93
Ti	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
Al	0.18	0.16	0.16	0.23	0.24	0.24	0.24	0.22	0.22	0.22	0.20	0.22	0.18
Fe^{2+}	0.15	0.16	0.15	0.15	0.17	0.17	0.20	0.17	0.20	0.13	0.14	0.15	0.18
Mn	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.69	0.70	0.69	0.63	0.61	0.61	0.61	0.63	0.66	0.64	0.66	0.65	0.71
Ca	0.86	0.87	0.87	0.82	0.81	0.78	0.78	0.78	0.76	0.81	0.83	0.83	0.84
Na	0.11	0.10	0.11	0.15	0.16	0.19	0.16	0.19	0.16	0.17	0.15	0.15	0.10
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.06	0.07	0.10	0.07	0.08	0.06	0.07	0.07	0.09	0.08	0.07	0.06
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Cpx 5.12	Cpx 5.13	Cpx 5.14	Cpx 5.15	Cpx 5.16	Cpx 5.17	Cpx 5.18	Cpx 5.20	Cpx 5.21	Cpx 6.1	Cpx 6.2	Cpx 6.3	Cpx 6.4
SiO_2	52.43	51.59	53.52	52.60	52.77	52.30	52.51	52.67	52.60	51.99	52.16	51.31	51.77
TiO_2	0.08	0.14	0.15	0.07	0.12	0.17	0.07	0.05	0.06	0.29	0.25	0.19	0.23
Al_2O_3	5.75	5.24	5.07	3.12	2.16	3.13	2.65	1.98	1.77	3.93	4.92	5.45	5.26
Fe*	7.08	7.07	6.86	7.25	7.06	6.97	7.38	7.34	7.59	7.67	7.34	7.71	7.44
MnO	0.07	0.07	0.03	0.11	0.09	0.08	0.08	0.10	0.11	0.06	0.07	0.09	0.09
MgO	11.46	11.89	11.71	12.99	13.60	13.03	13.06	13.33	13.30	12.30	11.65	11.49	11.58
CaO	20.17	20.59	19.59	22.69	22.50	22.47	23.09	23.14	22.80	21.96	21.67	21.89	21.46
Na_2O	2.52	2.30	2.68	1.00	0.83	1.17	0.96	0.84	0.69	1.42	1.71	1.45	1.71
K_2O	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.02	*n.d.*	0.02	*n.d.*	0.01	*n.d.*	0.01	*n.d.*
Cr_2O_3	0.08	0.07	0.06	0.04	0.03	0.05	0.01	*n.d.*	0.02	0.06	0.06	0.05	0.02
ZnO	0.02	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.03	0.01	*n.d.*	0.03	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.66	98.95	99.68	99.86	99.18	99.40	99.81	99.47	98.98	99.70	99.83	99.67	99.58
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.93	1.91	1.96	1.95	1.96	1.94	1.94	1.96	1.97	1.93	1.93	1.90	1.92
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
Al	0.25	0.23	0.22	0.14	0.09	0.14	0.12	0.09	0.08	0.17	0.21	0.24	0.23
Fe^{2+}	0.14	0.10	0.16	0.18	0.18	0.15	0.16	0.16	0.20	0.17	0.18	0.18	0.17
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.63	0.66	0.64	0.72	0.75	0.72	0.72	0.74	0.74	0.68	0.64	0.64	0.64
Ca	0.79	0.82	0.77	0.90	0.90	0.89	0.92	0.92	0.91	0.87	0.86	0.87	0.85
Na	0.18	0.16	0.19	0.07	0.06	0.08	0.07	0.06	0.05	0.10	0.12	0.10	0.12
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.08	0.12	0.05	0.05	0.04	0.07	0.07	0.06	0.04	0.07	0.05	0.06	0.06
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral	Clinopyroxene												
Sample	SPF 01C1	SPF 01C1	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Cpx 6.5	Cpx 6.6	Cpx 1.1	Cpx 1.2	Cpx 1.6	Cpx 1.7	Cpx 1.8	Cpx 1.9	Cpx 1.10	Cpx 1.11	Cpx 1.12	Cpx 1.13	Cpx 1.14
SiO_2	51.65	51.73	52.95	52.59	53.07	52.40	52.45	52.22	52.73	52.56	52.07	52.48	52.09
TiO_2	0.26	0.26	0.14	0.25	0.12	0.11	0.11	0.16	0.12	0.15	0.18	0.18	0.14
Al_2O_3	5.37	4.70	2.35	1.95	2.04	3.46	2.51	3.61	2.79	3.19	4.03	2.83	3.60
Fe*	7.82	7.43	6.92	7.46	6.83	6.94	6.60	6.90	6.71	6.74	6.75	7.04	6.84
MnO	0.09	0.06	0.04	0.05	0.06	0.06	0.08	0.05	0.05	0.04	0.05	0.06	0.07
MgO	11.36	11.97	13.83	14.57	13.95	13.12	13.84	13.34	13.60	13.58	12.88	13.55	13.08
CaO	21.83	21.52	22.86	21.79	22.85	22.09	22.41	22.19	21.92	22.32	21.66	22.03	22.12
Na_2O	1.58	1.71	1.03	0.65	1.00	1.33	1.04	1.31	1.45	1.31	1.63	1.30	1.42
K_2O	*n.d.*	0.01	*n.d.*	0.02	*n.d.*	0.02	0.02	0.02	*n.d.*	*n.d.*	*n.d.*	0.02	0.01
Cr_2O_3	0.07	0.06	0.09	0.13	0.08	0.05	0.09	0.01	0.05	0.06	0.10	0.06	0.06
ZnO	*n.d.*	0.01	0.03	0.04	0.02	*n.d.*	*n.d.*	0.04	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.04	99.47	100.24	99.49	100.02	99.58	99.15	99.84	99.42	99.95	99.35	99.56	99.46
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.91	1.92	1.95	1.95	1.95	1.94	1.95	1.92	1.95	1.93	1.92	1.94	1.92
Ti	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Al	0.23	0.21	0.10	0.09	0.09	0.15	0.11	0.16	0.12	0.14	0.18	0.12	0.16
Fe^{2+}	0.19	0.15	0.13	0.18	0.14	0.14	0.13	0.12	0.12	0.11	0.12	0.13	0.12
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.63	0.66	0.76	0.81	0.77	0.72	0.77	0.73	0.75	0.74	0.71	0.75	0.72
Ca	0.86	0.85	0.90	0.87	0.90	0.87	0.89	0.88	0.87	0.88	0.86	0.87	0.88
Na	0.11	0.12	0.07	0.05	0.07	0.10	0.07	0.09	0.10	0.09	0.12	0.09	0.10
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.05	0.08	0.08	0.05	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.10
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Cpx 1.15	Cpx 1.16	Cpx 1.17	Cpx 1.18	Cpx 1.19	Cpx 1.20	Cpx 1.21	Cpx 1.22	Cpx 1.23	Cpx 1.24	Cpx 1.25	Cpx 1.26	Cpx 1.27
SiO_2	52.12	51.85	51.41	51.85	51.40	52.49	52.81	48.36	50.10	51.53	52.53	52.28	51.48
TiO_2	0.18	0.10	0.11	0.12	0.12	0.20	0.12	0.13	0.13	0.12	0.11	0.08	0.24
Al_2O_3	2.88	3.65	4.04	4.38	5.24	4.46	3.06	3.01	4.74	3.41	5.38	5.67	6.76
Fe*	7.30	7.08	7.07	7.43	7.23	6.63	7.02	6.80	7.56	7.50	6.79	6.86	6.68
MnO	0.05	0.06	0.06	0.07	0.04	0.05	0.04	0.06	0.06	0.06	0.05	0.04	0.06
MgO	13.29	12.94	12.71	12.40	12.07	12.55	13.40	12.28	12.41	12.92	12.29	11.83	11.53
CaO	22.30	21.85	21.56	21.22	20.70	20.82	22.12	21.93	21.01	21.64	20.46	20.36	20.24
Na_2O	1.19	1.46	1.47	1.61	1.95	1.89	1.25	1.01	0.94	1.20	2.16	2.37	2.20
K_2O	*n.d.*	*n.d.*	0.01	*n.d.*	0.02	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*
Cr_2O_3	0.03	0.06	0.02	*n.d.*	0.04	0.03	0.07	0.07	0.07	0.11	0.12	0.07	*n.d.*
ZnO	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	0.03	0.02	*n.d.*	*n.d.*	0.01	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.33	99.06	98.46	99.09	98.80	99.12	99.90	93.70	97.05	98.49	99.88	99.57	99.19
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.93	1.92	1.92	1.93	1.91	1.94	1.95	1.90	1.91	1.93	1.92	1.92	1.90
Ti	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Al	0.13	0.16	0.18	0.19	0.23	0.19	0.13	0.14	0.21	0.15	0.23	0.25	0.29
Fe^{2+}	0.13	0.12	0.13	0.15	0.13	0.15	0.15	0.09	0.20	0.16	0.14	0.12	0.15
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.73	0.72	0.71	0.69	0.67	0.69	0.74	0.72	0.70	0.72	0.67	0.65	0.63
Ca	0.89	0.87	0.86	0.84	0.82	0.82	0.87	0.92	0.86	0.87	0.80	0.80	0.80
Na	0.09	0.11	0.11	0.12	0.14	0.14	0.09	0.08	0.07	0.09	0.15	0.17	0.16
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.09	0.10	0.09	0.08	0.10	0.06	0.07	0.13	0.04	0.08	0.07	0.09	0.06
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral	Clinopyroxene												
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Cpx 1.29	Cpx 1.30	Cpx 1.31	Cpx 1.32	Cpx 2.1	Cpx 2.2	Cpx 2.3	Cpx 2.4	Cpx 2.5	Cpx 2.6	Cpx 3.1	Cpx 3.2	Cpx 3.3
SiO_2	51.68	52.53	51.50	51.45	52.29	50.68	51.77	52.13	51.05	52.24	52.74	52.85	53.14
TiO_2	0.17	0.19	0.20	0.17	0.08	0.13	0.15	0.10	0.17	0.08	0.09	0.03	0.01
Al_2O_3	4.84	4.61	5.87	6.42	4.51	6.20	5.25	4.25	4.26	2.19	2.85	2.40	1.76
Fe*	6.36	6.48	7.22	7.73	6.59	7.71	7.31	7.60	7.76	7.41	8.26	8.06	8.30
MnO	0.04	0.05	0.06	0.06	0.05	0.07	0.07	0.05	0.07	0.07	0.07	0.07	0.07
MgO	12.73	12.98	11.62	10.92	12.47	11.25	11.83	12.52	12.35	13.60	13.02	13.25	13.44
CaO	21.22	20.98	20.63	19.16	20.58	20.11	20.19	20.80	20.81	22.16	21.69	22.21	22.45
Na_2O	1.66	2.04	2.05	2.55	2.16	2.26	2.26	1.80	1.65	1.13	1.29	1.13	0.99
K_2O	*n.d.*	*n.d.*	*n.d.*	0.01	0.01	0.02	0.01	0.01	*n.d.*	*n.d.*	0.01	*n.d.*	0.01
Cr_2O_3	0.09	0.06	*n.d.*	0.03	0.06	0.01	0.05	0.04	0.01	*n.d.*	0.01	*n.d.*	0.09
ZnO	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	0.05	0.01	0.01	*n.d.*	0.01	0.02	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.79	99.92	99.15	98.52	98.80	98.44	98.93	99.32	98.14	98.89	100.05	100.01	100.28
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.92	1.92	1.91	1.92	1.93	1.89	1.92	1.93	1.91	1.95	1.95	1.95	1.96
Ti	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	0.21	0.20	0.26	0.28	0.20	0.27	0.23	0.19	0.19	0.10	0.12	0.10	0.08
Fe^{2+}	0.12	0.10	0.15	0.17	0.11	0.12	0.13	0.15	0.14	0.13	0.18	0.17	0.18
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.70	0.71	0.64	0.61	0.69	0.63	0.65	0.69	0.69	0.76	0.72	0.73	0.74
Ca	0.84	0.82	0.82	0.76	0.82	0.80	0.80	0.82	0.84	0.88	0.86	0.88	0.89
Na	0.12	0.14	0.15	0.18	0.15	0.16	0.16	0.13	0.12	0.08	0.09	0.08	0.07
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.10	0.08	0.07	0.09	0.12	0.10	0.09	0.10	0.10	0.08	0.08	0.08
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Cpx 3.4	Cpx 3.5	Cpx 3.6	Cpx 4.1	Cpx 4.2	Cpx 4.3	Cpx 4.4	Cpx 4.5	Cpx 4.6	Cpx 4.10	Cpx 4.11	Cpx 4.12	Cpx 4.13
SiO_2	52.29	52.55	53.00	52.32	52.34	52.31	53.53	52.40	52.55	53.20	52.26	52.39	52.66
TiO_2	0.08	0.06	0.06	0.16	0.17	0.14	0.04	0.18	0.18	0.14	0.16	0.17	0.20
Al_2O_3	2.77	1.75	2.41	4.00	5.73	6.44	6.73	3.69	4.78	2.18	5.98	4.15	3.56
Fe*	8.39	8.19	8.12	6.70	6.61	6.56	6.35	6.50	6.74	6.28	6.20	6.58	6.54
MnO	0.08	0.08	0.09	0.07	0.05	0.05	0.06	0.06	0.03	0.05	0.04	0.05	0.03
MgO	12.83	13.42	13.19	13.18	12.09	11.75	11.39	13.29	12.38	14.18	12.00	13.15	13.41
CaO	21.71	21.99	21.85	21.79	20.48	20.25	18.64	22.12	21.54	22.92	20.22	21.65	21.81
Na_2O	1.31	1.04	1.17	1.43	2.23	2.27	3.35	1.31	1.74	1.00	2.44	1.67	1.43
K_2O	0.01	0.03	0.01	*n.d.*	*n.d.*	0.03	0.01	0.04	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*
Cr_2O_3	0.03	0.07	0.03	0.08	*n.d.*	0.06	0.09	0.06	0.06	0.07	0.07	0.03	*n.d.*
ZnO	0.06	*n.d.*	0.03	0.02	0.04	0.02	*n.d.*	*n.d.*	0.03	0.01	*n.d.*	*n.d.*	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.57	99.19	99.96	99.75	99.75	99.87	100.20	99.65	100.02	100.03	99.38	99.84	99.66
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.94	1.96	1.96	1.93	1.92	1.92	1.94	1.93	1.93	1.95	1.92	1.92	1.94
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
Al	0.12	0.08	0.11	0.17	0.25	0.28	0.29	0.16	0.21	0.09	0.26	0.18	0.15
Fe^{2+}	0.17	0.17	0.19	0.13	0.13	0.15	0.12	0.13	0.15	0.13	0.11	0.11	0.13
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.71	0.75	0.73	0.72	0.66	0.64	0.62	0.73	0.68	0.78	0.66	0.72	0.74
Ca	0.86	0.88	0.87	0.86	0.80	0.79	0.72	0.87	0.85	0.90	0.80	0.85	0.86
Na	0.09	0.08	0.08	0.10	0.16	0.16	0.24	0.09	0.12	0.07	0.17	0.12	0.10
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.09	0.09	0.07	0.07	0.07	0.05	0.07	0.07	0.06	0.07	0.08	0.09	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Cpx 4.14	Cpx 4.15	Cpx 4.16	Cpx 4.17	Cpx 4.18	Cpx 4.19	Cpx 4.20	Cpx 4.21	Cpx 4.22	Cpx 4.23	Cpx 4.24	Cpx 4.25	Cpx 4.29
SiO_2	53.26	52.75	52.67	52.72	52.67	53.51	52.70	53.40	52.75	51.96	52.52	52.02	52.81
TiO_2	0.11	0.17	0.18	0.12	0.18	0.12	0.14	0.10	0.13	0.09	0.12	0.16	0.21
Al_2O_3	2.61	3.36	3.48	1.95	2.50	1.48	2.79	1.14	2.64	3.47	2.88	3.40	1.89
Fe*	6.50	6.46	6.48	6.27	6.55	6.68	6.65	6.64	6.54	6.27	6.41	6.58	6.55
MnO	0.03	0.06	0.05	0.07	0.02	0.07	0.06	0.07	0.06	0.02	0.04	0.07	0.04
MgO	13.87	13.56	13.59	14.25	13.76	14.35	13.74	14.56	13.96	13.55	13.80	13.57	14.31
CaO	22.57	22.16	22.17	23.03	22.12	22.87	22.40	23.15	22.69	21.93	22.20	21.92	22.89
Na_2O	1.03	1.26	1.41	0.94	1.04	0.84	1.23	0.79	1.15	1.13	1.27	1.24	0.88
K_2O	0.01	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01
Cr_2O_3	0.03	0.06	0.04	0.05	0.03	0.04	0.04	*n.d.*	*n.d.*	0.04	0.12	0.04	*n.d.*
ZnO	*n.d.*	0.02	0.03	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.04	0.04	0.04	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.03	99.85	100.10	99.44	98.90	99.98	99.76	99.84	99.95	98.50	99.41	99.00	99.60
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.96	1.94	1.93	1.95	1.96	1.97	1.94	1.97	1.94	1.94	1.94	1.93	1.95
Ti	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Al	0.11	0.15	0.15	0.08	0.11	0.06	0.12	0.05	0.11	0.15	0.13	0.15	0.08
Fe^{2+}	0.15	0.14	0.11	0.11	0.16	0.15	0.12	0.13	0.11	0.14	0.11	0.12	0.12
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.76	0.74	0.74	0.79	0.76	0.79	0.75	0.80	0.76	0.75	0.76	0.75	0.79
Ca	0.89	0.87	0.87	0.91	0.88	0.90	0.88	0.91	0.89	0.88	0.88	0.87	0.91
Na	0.07	0.09	0.10	0.07	0.07	0.06	0.09	0.06	0.08	0.08	0.09	0.09	0.06
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.05	0.06	0.09	0.09	0.05	0.06	0.09	0.07	0.09	0.06	0.09	0.08	0.08
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Cpx 4.30	Cpx 4.31	Cpx 4.32	Cpx 4.33	Cpx 4.34	Cpx 4.36	Cpx 4.37	Cpx 5.1	Cpx 5.2	Cpx 5.5	Cpx 5.8	Cpx 5.9	Cpx 5.10
SiO_2	52.71	52.83	53.27	52.95	52.48	52.64	52.45	52.52	52.21	53.08	52.47	52.30	51.69
TiO_2	0.15	0.13	0.17	0.15	0.18	0.12	0.12	0.13	0.17	0.10	0.11	0.13	0.18
Al_2O_3	2.12	2.03	1.73	3.89	2.78	2.83	3.82	5.47	4.27	2.40	3.22	4.02	4.17
Fe*	6.50	6.43	6.92	6.77	6.85	7.17	7.25	8.14	7.22	6.54	7.22	7.66	7.56
MnO	0.03	0.04	0.04	0.06	0.06	0.05	0.08	0.08	0.07	0.07	0.05	0.09	0.07
MgO	14.19	14.21	14.24	13.14	13.95	13.55	13.00	13.20	12.89	14.03	13.17	12.61	12.65
CaO	22.54	22.94	23.15	21.48	22.44	21.95	21.86	17.73	21.35	22.59	21.90	21.18	22.12
Na_2O	0.91	0.94	0.79	1.72	0.98	1.29	1.58	1.84	1.53	1.31	1.51	1.71	1.32
K_2O	0.02	*n.d.*	*n.d.*	0.01	0.01	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
Cr_2O_3	0.11	0.07	0.08	0.06	0.07	0.05	0.06	0.08	0.05	0.06	0.09	*n.d.*	0.04
ZnO	0.01	0.05	*n.d.*	0.02	*n.d.*	*n.d.*	0.02	*n.d.*	0.03	0.03	0.03	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.30	99.66	100.40	100.25	99.80	99.65	100.25	99.21	99.80	100.21	99.77	99.70	99.81
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.95	1.95	1.96	1.94	1.94	1.94	1.92	1.94	1.92	1.94	1.93	1.93	1.91
Ti	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Al	0.09	0.09	0.07	0.17	0.12	0.12	0.17	0.24	0.19	0.10	0.14	0.17	0.18
Fe^{2+}	0.13	0.12	0.15	0.13	0.13	0.14	0.12	0.24	0.15	0.10	0.12	0.14	0.14
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.78	0.78	0.78	0.72	0.77	0.75	0.71	0.73	0.71	0.77	0.72	0.69	0.70
Ca	0.89	0.91	0.91	0.84	0.89	0.87	0.86	0.70	0.84	0.89	0.86	0.84	0.88
Na	0.07	0.07	0.06	0.12	0.07	0.09	0.11	0.13	0.11	0.09	0.11	0.12	0.09
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.08	0.07	0.08	0.08	0.08	0.10	0.01	0.08	0.11	0.10	0.09	0.09
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Cpx 5.11	Cpx 5.12	Cpx 5.13	Cpx 5.14	Cpx 5.15	Cpx 5.16	Cpx 5.17	Cpx 5.18	Cpx 5.19	Cpx 5.20	Cpx 5.21	Cpx 5.22	Cpx 5.24
SiO_2	51.87	52.12	51.75	52.12	52.23	52.32	52.22	52.28	52.71	52.29	52.62	51.59	51.81
TiO_2	0.16	0.14	0.13	0.15	0.11	0.18	0.16	0.12	0.09	0.06	0.14	0.03	0.15
Al_2O_3	3.87	3.10	4.90	4.38	4.95	4.44	4.21	2.26	2.99	2.90	2.98	6.52	6.20
Fe*	7.27	7.38	7.47	7.37	7.22	6.65	6.74	6.78	6.65	6.74	6.63	7.60	7.27
MnO	0.09	0.07	0.07	0.08	0.07	0.04	0.04	0.03	0.10	0.05	0.06	0.06	0.05
MgO	12.99	13.15	12.31	12.61	12.32	12.68	12.92	13.92	13.49	13.57	13.70	11.97	11.51
CaO	22.07	21.85	21.00	21.33	21.00	20.69	21.53	22.71	22.13	22.16	22.00	18.82	20.32
Na_2O	1.26	1.22	1.85	1.60	1.62	1.91	1.75	1.04	1.35	1.22	1.37	2.31	2.27
K_2O	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	0.03
Cr_2O_3	0.03	*n.d.*	0.02	*n.d.*	0.01	0.07	0.11	0.06	0.09	0.09	0.07	0.04	0.08
ZnO	0.02	*n.d.*	0.01	0.02	*n.d.*	0.02	*n.d.*	0.02	0.02	*n.d.*	*n.d.*	0.01	0.04
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.64	99.03	99.51	99.67	99.54	99.02	99.68	99.23	99.61	99.10	99.56	98.95	99.74
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.92	1.94	1.91	1.92	1.93	1.94	1.92	1.94	1.94	1.94	1.94	1.91	1.90
Ti	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	0.17	0.14	0.21	0.19	0.22	0.19	0.18	0.10	0.13	0.13	0.13	0.28	0.27
Fe^{2+}	0.14	0.15	0.13	0.15	0.18	0.13	0.11	0.11	0.12	0.12	0.11	0.16	0.14
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.72	0.73	0.68	0.69	0.68	0.70	0.71	0.77	0.74	0.75	0.75	0.66	0.63
Ca	0.87	0.87	0.83	0.84	0.83	0.82	0.85	0.90	0.87	0.88	0.87	0.75	0.80
Na	0.09	0.09	0.13	0.11	0.12	0.14	0.12	0.07	0.10	0.09	0.10	0.17	0.16
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.09	0.08	0.10	0.08	0.04	0.07	0.10	0.10	0.08	0.09	0.09	0.08	0.08
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Cpx 5.27	Cpx 5.28	Cpx 5.30	Cpx 5.31	Cpx 6.2	Cpx 6.3	Cpx 6.4	Cpx 6.5	Cpx 6.6	Cpx 6.9	Cpx 6.11	Cpx 6.12	Cpx 6.13
SiO_2	50.92	52.03	51.95	52.14	53.29	51.79	52.96	52.68	52.72	52.06	53.02	53.59	53.20
TiO_2	0.20	0.20	0.19	0.14	0.13	0.10	0.05	0.07	0.05	0.13	0.10	0.01	0.13
Al_2O_3	6.28	6.93	3.13	2.50	1.97	4.22	2.13	2.39	2.05	3.47	1.88	1.75	6.75
Fe*	8.08	7.01	6.60	6.55	6.62	7.37	6.31	6.85	6.78	6.19	6.67	6.68	6.69
MnO	0.06	0.07	0.06	0.05	0.09	0.05	0.06	0.06	0.06	0.07	0.06	0.06	0.06
MgO	11.58	11.33	13.69	13.94	14.14	12.82	14.17	13.83	14.05	13.50	14.12	14.30	11.24
CaO	20.85	19.70	22.01	22.45	22.41	21.94	22.49	22.65	23.03	21.26	22.73	22.80	18.46
Na_2O	1.77	2.51	0.99	0.95	1.02	1.47	1.09	1.01	0.94	1.20	0.84	0.93	3.44
K_2O	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	*n.d.*
Cr_2O_3	0.09	0.03	0.05	0.07	0.06	0.02	0.11	0.15	0.09	0.12	0.11	0.10	0.12
ZnO	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	0.06	0.02	0.03	*n.d.*	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.83	99.81	98.71	98.80	99.73	99.82	99.37	99.68	99.82	98.01	99.58	100.25	100.11
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.88	1.91	1.94	1.94	1.97	1.91	1.96	1.95	1.94	1.95	1.96	1.97	1.93
Ti	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	0.27	0.30	0.14	0.11	0.09	0.18	0.09	0.10	0.09	0.15	0.08	0.08	0.29
Fe^{2+}	0.16	0.15	0.15	0.13	0.15	0.12	0.12	0.13	0.12	0.16	0.15	0.14	0.11
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.64	0.62	0.76	0.77	0.78	0.70	0.78	0.76	0.77	0.75	0.78	0.78	0.61
Ca	0.82	0.77	0.88	0.90	0.89	0.87	0.89	0.90	0.91	0.85	0.90	0.90	0.72
Na	0.13	0.18	0.07	0.07	0.07	0.11	0.08	0.07	0.07	0.09	0.06	0.07	0.24
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.09	0.06	0.06	0.08	0.06	0.11	0.08	0.08	0.09	0.03	0.06	0.06	0.09
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral	Clinopyroxene												
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Cpx 6.14	Cpx 6.15	Cpx 6.16	Cpx 6.17	Cpx 6.18	Cpx 1.1	Cpx 1.2	Cpx 1.3	Cpx 1.4	Cpx 1.5	Cpx 1.6	Cpx 1.7	Cpx 1.8
SiO_2	53.10	52.01	51.54	51.65	52.76	50.81	51.59	52.25	51.99	51.87	52.14	52.09	52.15
TiO_2	0.06	0.12	0.20	0.18	0.16	0.24	0.11	0.16	0.27	0.28	0.31	0.15	0.30
Al_2O_3	6.71	6.54	4.75	4.39	5.95	5.31	3.78	4.28	5.45	5.69	4.49	5.68	4.43
Fe*	6.74	6.41	7.68	7.50	7.08	8.38	8.65	9.15	8.88	8.57	8.90	8.80	8.79
MnO	0.05	0.04	0.05	0.06	0.05	0.08	0.10	0.11	0.08	0.08	0.11	0.11	0.11
MgO	11.40	11.64	12.49	12.95	11.60	11.03	11.75	11.49	10.76	10.95	11.40	10.89	11.58
CaO	19.02	19.90	21.68	21.81	19.02	19.82	19.80	20.19	19.53	19.74	20.11	19.33	20.46
Na_2O	3.06	2.61	1.42	1.34	2.86	2.04	1.67	2.14	2.47	2.35	2.14	2.55	1.96
K_2O	*n.d.*	*n.d.*	0.01	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
Cr_2O_3	*n.d.*	0.07	0.09	0.04	0.13	0.03	0.15	0.01	0.06	0.01	0.03	0.08	0.03
ZnO	0.02	0.03	0.02	0.02	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	0.02	*n.d.*	0.04	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.17	99.37	99.93	99.95	99.60	97.75	97.63	99.78	99.49	99.56	99.63	99.71	99.83
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.93	1.91	1.90	1.90	1.93	1.92	1.95	1.93	1.93	1.92	1.93	1.92	1.93
Ti	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.01
Al	0.29	0.28	0.21	0.19	0.26	0.24	0.17	0.19	0.24	0.25	0.20	0.25	0.19
Fe^{2+}	0.13	0.11	0.15	0.13	0.14	0.19	0.23	0.18	0.20	0.19	0.19	0.18	0.19
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.62	0.64	0.69	0.71	0.63	0.62	0.66	0.63	0.59	0.60	0.63	0.60	0.64
Ca	0.74	0.78	0.86	0.86	0.75	0.80	0.80	0.80	0.78	0.78	0.80	0.76	0.81
Na	0.22	0.19	0.10	0.10	0.20	0.15	0.12	0.15	0.18	0.17	0.15	0.18	0.14
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.09	0.09	0.10	0.08	0.07	0.04	0.10	0.08	0.07	0.08	0.09	0.08
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral	Clinopyroxene												
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Cpx 1.9	Cpx 1.10	Cpx 1.11	Cpx 1.12	Cpx 1.13	Cpx 1.14	Cpx 1.15	Cpx 2.2	Cpx 2.3	Cpx 2.5	Cpx 2.6	Cpx 2.8	Cpx 2.9
SiO_2	52.58	52.12	51.94	51.94	51.61	52.17	52.00	49.13	52.16	52.91	52.74	52.97	51.85
TiO_2	0.09	0.33	0.28	0.26	0.28	0.16	0.26	0.45	0.19	0.12	0.05	0.04	0.21
Al_2O_3	1.72	3.85	5.54	4.99	6.00	4.01	4.11	6.44	3.69	2.74	0.62	1.24	3.56
Fe*	8.70	8.86	8.78	8.67	8.84	9.17	8.96	11.70	8.85	8.17	8.95	8.83	8.51
MnO	0.12	0.12	0.09	0.08	0.10	0.09	0.10	0.09	0.11	0.09	0.13	0.11	0.09
MgO	12.66	11.83	10.83	11.14	10.65	11.57	11.46	11.96	11.98	12.45	12.76	12.88	12.31
CaO	22.58	20.53	18.97	19.84	19.42	20.34	20.43	16.16	21.07	21.49	23.99	23.16	21.34
Na_2O	1.01	1.90	2.60	2.27	2.39	1.90	1.92	1.74	1.71	1.39	0.47	0.84	1.48
K_2O	*n.d.*	0.02	0.02	0.02	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01
Cr_2O_3	0.11	0.06	0.06	0.07	0.01	0.07	0.06	0.03	0.08	0.11	0.02	0.07	0.09
ZnO	0.02	0.02	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.05	0.01	0.01	*n.d.*	0.01	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.59	99.64	99.13	99.28	99.30	99.49	99.30	97.79	99.85	99.47	99.73	100.16	99.46
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.96	1.93	1.93	1.93	1.92	1.94	1.94	1.86	1.93	1.97	1.98	1.97	1.93
Ti	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01
Al	0.08	0.17	0.24	0.22	0.26	0.18	0.18	0.29	0.16	0.12	0.03	0.05	0.16
Fe^{2+}	0.20	0.18	0.19	0.19	0.20	0.21	0.20	0.27	0.18	0.21	0.22	0.20	0.17
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.70	0.65	0.60	0.62	0.59	0.64	0.64	0.68	0.66	0.69	0.71	0.71	0.68
Ca	0.90	0.82	0.75	0.79	0.77	0.81	0.82	0.66	0.84	0.86	0.96	0.92	0.85
Na	0.07	0.14	0.19	0.16	0.17	0.14	0.14	0.13	0.12	0.10	0.03	0.06	0.11
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.09	0.08	0.08	0.07	0.08	0.08	0.10	0.09	0.04	0.06	0.08	0.09
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Cpx 2.11	Cpx 2.12	Cpx 2.13	Cpx 2.14	Cpx 2.15	Cpx 2.19	Cpx 2.20	Cpx 3.1	Cpx 3.2	Cpx 3.4	Cpx 3.5	Cpx 3.6	Cpx 3.7
SiO_2	50.53	52.82	52.52	51.67	51.91	52.75	52.55	51.26	51.78	51.91	52.43	51.41	51.06
TiO_2	0.18	0.02	0.21	0.18	0.29	0.04	0.11	0.26	0.28	0.29	0.19	0.21	0.35
Al_2O_3	4.22	0.49	1.44	5.54	4.30	2.43	4.97	5.13	5.17	3.53	2.52	5.93	6.51
Fe*	8.86	8.36	8.11	8.08	8.33	8.43	8.17	8.50	8.31	8.00	8.16	8.18	8.24
MnO	0.08	0.11	0.10	0.10	0.11	0.08	0.11	0.11	0.08	0.10	0.10	0.08	0.10
MgO	11.48	13.30	12.98	11.32	11.81	12.83	11.57	11.33	11.26	12.33	12.68	11.00	10.70
CaO	18.62	23.89	23.21	20.52	20.75	21.05	19.72	20.75	20.17	21.31	21.73	19.51	19.19
Na_2O	1.54	0.41	0.75	2.13	1.76	1.45	2.45	1.88	2.02	1.58	1.38	2.39	2.52
K_2O	0.05	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*
Cr_2O_3	0.06	0.07	0.12	0.06	0.02	0.03	0.02	0.05	0.07	0.05	0.11	0.06	0.04
ZnO	0.03	0.02	*n.d.*	*n.d.*	0.04	0.02	0.02	*n.d.*	*n.d.*	*n.d.*	0.01	0.04	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	95.66	99.50	99.44	99.59	99.33	99.13	99.69	99.29	99.16	99.09	99.32	98.81	98.71
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.96	1.98	1.96	1.91	1.93	1.97	1.94	1.91	1.93	1.93	1.95	1.91	1.90
Ti	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Al	0.19	0.02	0.06	0.24	0.19	0.11	0.22	0.22	0.23	0.15	0.11	0.26	0.29
Fe^{2+}	0.28	0.20	0.19	0.16	0.19	0.19	0.16	0.17	0.20	0.17	0.17	0.17	0.18
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.66	0.74	0.72	0.62	0.65	0.71	0.64	0.63	0.62	0.68	0.70	0.61	0.59
Ca	0.77	0.96	0.93	0.81	0.83	0.84	0.78	0.83	0.80	0.85	0.87	0.78	0.77
Na	0.12	0.03	0.05	0.15	0.13	0.10	0.18	0.14	0.15	0.11	0.10	0.17	0.18
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.01	0.06	0.06	0.09	0.07	0.07	0.09	0.09	0.06	0.08	0.08	0.08	0.08
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Cpx 3.8	Cpx 3.9	Cpx 3.10	Cpx 3.11	Cpx 3.13	Cpx 3.14	Cpx 3.15	Cpx 3.16	Cpx 3.17	Cpx 3.18	Cpx 3.20	Cpx 3.23	Cpx 3.24
SiO_2	52.40	52.74	51.15	51.99	52.13	52.05	51.37	51.03	51.36	51.34	51.22	51.62	51.68
TiO_2	0.09	0.17	0.27	0.18	0.19	0.23	0.26	0.19	0.37	0.20	0.21	0.23	0.23
Al_2O_3	1.91	5.23	4.16	2.43	5.84	5.47	5.71	5.23	5.37	5.10	4.51	3.79	5.31
Fe*	8.24	7.97	8.77	8.52	8.14	8.10	8.67	8.82	8.36	8.16	8.60	8.76	8.74
MnO	0.09	0.07	0.10	0.11	0.09	0.08	0.08	0.10	0.09	0.09	0.10	0.10	0.09
MgO	12.99	11.29	11.77	12.53	10.84	10.94	10.98	11.00	11.02	11.26	11.65	11.75	11.01
CaO	22.05	19.19	21.30	21.69	18.81	18.89	19.82	19.75	19.85	19.87	20.28	20.85	20.04
Na_2O	1.15	2.92	1.72	1.27	2.91	2.84	2.43	2.31	2.29	2.38	1.99	1.65	2.21
K_2O	0.02	0.02	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	*n.d.*
Cr_2O_3	0.01	0.10	0.06	0.03	0.06	0.07	0.06	0.05	0.05	0.04	0.09	0.03	*n.d.*
ZnO	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	0.03	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.96	99.71	99.33	98.76	99.01	98.72	99.40	98.49	98.76	98.44	98.67	98.82	99.33
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.96	1.94	1.90	1.95	1.93	1.93	1.90	1.91	1.92	1.92	1.91	1.93	1.92
Ti	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Al	0.08	0.23	0.18	0.11	0.25	0.24	0.25	0.23	0.24	0.22	0.20	0.17	0.23
Fe^{2+}	0.17	0.14	0.15	0.18	0.16	0.16	0.16	0.16	0.18	0.14	0.16	0.19	0.19
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.72	0.62	0.65	0.70	0.60	0.61	0.61	0.61	0.61	0.63	0.65	0.66	0.61
Ca	0.88	0.76	0.85	0.87	0.75	0.75	0.79	0.79	0.79	0.79	0.81	0.84	0.80
Na	0.08	0.21	0.12	0.09	0.21	0.20	0.17	0.17	0.17	0.17	0.14	0.12	0.16
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.08	0.11	0.13	0.08	0.09	0.09	0.11	0.11	0.08	0.11	0.11	0.08	0.08
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Cpx 3.25	Cpx 4.9	Cpx 4.10	Cpx 4.11	Cpx 4.12	Cpx 4.13	Cpx 4.14	Cpx 4.17	Cpx 4.18	Cpx 4.19	Cpx 4.21	Cpx 4.23	Cpx 4.24
SiO_2	51.55	51.85	51.55	52.33	50.74	52.50	51.57	50.54	50.99	52.79	51.84	50.95	49.57
TiO_2	0.20	0.12	0.11	0.03	0.18	0.12	0.20	0.27	0.17	0.07	0.18	0.07	0.23
Al_2O_3	5.54	4.11	4.21	2.57	5.03	2.96	4.24	5.00	4.09	1.62	2.63	4.04	4.71
Fe*	8.30	9.37	9.95	10.20	9.13	9.76	9.30	8.84	9.78	9.33	10.00	10.64	10.40
MnO	0.09	0.13	0.11	0.10	0.12	0.09	0.12	0.08	0.08	0.12	0.13	0.11	0.11
MgO	11.23	11.47	10.99	11.59	10.62	11.77	11.43	11.48	10.99	12.61	11.60	10.37	10.12
CaO	19.38	20.75	20.50	21.09	20.11	20.58	21.14	21.14	19.65	22.45	21.38	18.80	18.78
Na_2O	2.52	1.88	1.77	1.37	1.92	1.80	1.65	1.61	1.82	1.05	1.36	2.03	2.21
K_2O	*n.d.*	*n.d.*	0.01	0.01	*n.d.*	0.03	*n.d.*	0.04	0.04	*n.d.*	*n.d.*	0.04	0.02
Cr_2O_3	0.08	0.01	*n.d.*	*n.d.*	0.09	0.04	0.10	0.01	0.06	*n.d.*	0.08	*n.d.*	*n.d.*
ZnO	*n.d.*	*n.d.*	0.03	0.02	0.06	0.02	0.05	0.02	0.03	0.04	*n.d.*	0.03	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.89	99.69	99.24	99.31	98.00	99.67	99.82	99.03	97.70	100.07	99.20	97.08	96.17
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.91	1.93	1.93	1.96	1.92	1.95	1.92	1.89	1.94	1.96	1.95	1.95	1.91
Ti	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01
Al	0.24	0.18	0.19	0.11	0.22	0.13	0.19	0.22	0.18	0.07	0.12	0.18	0.21
Fe^{2+}	0.15	0.18	0.23	0.25	0.21	0.21	0.19	0.16	0.23	0.21	0.23	0.27	0.22
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.62	0.63	0.61	0.65	0.60	0.65	0.63	0.64	0.62	0.70	0.65	0.59	0.58
Ca	0.77	0.83	0.82	0.85	0.81	0.82	0.84	0.85	0.80	0.89	0.86	0.77	0.78
Na	0.18	0.14	0.13	0.10	0.14	0.13	0.12	0.12	0.13	0.08	0.10	0.15	0.17
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.11	0.11	0.09	0.07	0.08	0.10	0.09	0.12	0.08	0.08	0.08	0.07	0.12
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral						Clinopyroxene							
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Cpx 4.25	Cpx 4.26	Cpx 4.27	Cpx 4.28	Cpx 4.29	Cpx 4.30	Cpx 4.31	Cpx 4.32	Cpx 4.33	Cpx 4.34	Cpx 4.35	Cpx 4.36	Cpx 4.37
SiO_2	51.55	51.70	51.55	51.56	51.37	51.96	52.02	51.45	50.61	51.20	52.15	51.74	52.01
TiO_2	0.22	0.15	0.22	0.34	0.23	0.14	0.08	0.16	0.36	0.19	0.17	0.08	0.13
Al_2O_3	4.25	3.76	6.62	6.00	5.23	2.83	2.52	5.16	5.66	4.44	5.47	5.38	2.71
Fe*	9.34	9.67	9.09	9.07	9.36	9.56	9.91	9.64	9.11	9.39	9.59	9.73	10.40
MnO	0.12	0.13	0.12	0.12	0.12	0.12	0.10	0.10	0.12	0.11	0.09	0.13	0.13
MgO	11.31	11.20	10.30	10.59	10.76	11.94	11.79	10.72	10.91	11.23	10.47	10.53	11.68
CaO	20.77	20.73	19.13	19.72	20.06	21.77	20.99	20.03	20.00	20.72	19.55	19.29	21.17
Na_2O	1.78	1.66	2.66	2.45	2.02	1.44	1.47	2.16	1.83	1.85	2.54	2.44	1.44
K_2O	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.01
Cr_2O_3	0.09	0.08	0.02	0.08	*n.d.*	0.05	0.02	0.02	0.07	*n.d.*	0.03	*n.d.*	0.02
ZnO	0.03	*n.d.*	0.01	*n.d.*	0.06	0.02	0.02	0.02	0.01	*n.d.*	0.02	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.47	99.10	99.73	99.92	99.20	99.84	98.92	99.45	98.69	99.14	100.08	99.32	99.71
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.92	1.94	1.90	1.90	1.92	1.93	1.96	1.92	1.90	1.91	1.93	1.93	1.94
Ti	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
Al	0.19	0.17	0.29	0.26	0.23	0.12	0.11	0.23	0.25	0.20	0.24	0.24	0.12
Fe^{2+}	0.20	0.23	0.19	0.19	0.22	0.19	0.22	0.20	0.21	0.18	0.20	0.21	0.23
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.63	0.63	0.57	0.58	0.60	0.66	0.66	0.59	0.61	0.63	0.58	0.58	0.65
Ca	0.83	0.83	0.76	0.78	0.80	0.87	0.85	0.80	0.80	0.83	0.77	0.77	0.85
Na	0.13	0.12	0.19	0.18	0.15	0.10	0.11	0.16	0.13	0.13	0.18	0.18	0.10
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.09	0.08	0.09	0.09	0.08	0.11	0.09	0.10	0.07	0.11	0.09	0.09	0.10
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral							Clinopyroxene						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Cpx 4.38	Cpx 5.1	Cpx 5.2	Cpx 5.3	Cpx 5.4	Cpx 5.5	Cpx 5.6	Cpx 5.7	Cpx 5.8	Cpx 6.1	Cpx 6.2	Cpx 6.3	Cpx 6.4
SiO_2	52.00	51.52	50.53	51.56	51.58	51.32	51.38	51.65	51.44	51.52	51.61	52.34	50.47
TiO_2	0.10	0.37	0.14	0.17	0.10	0.16	0.04	0.20	0.25	0.16	0.07	0.08	0.14
Al_2O_3	2.56	5.12	3.12	4.54	4.46	5.83	5.32	5.37	5.13	5.81	6.26	2.78	4.46
Fe*	10.50	9.12	9.73	9.74	10.11	10.01	9.53	9.38	9.98	9.53	9.86	10.49	10.90
MnO	0.10	0.11	0.11	0.10	0.09	0.14	0.12	0.11	0.12	0.11	0.11	0.13	0.10
MgO	11.65	10.83	11.25	10.84	10.75	10.41	10.85	10.62	10.52	10.46	10.10	11.45	10.87
CaO	20.78	19.89	19.98	20.40	19.80	19.40	19.91	19.10	19.74	19.76	18.70	20.80	20.41
Na_2O	1.57	2.33	1.63	1.95	2.07	2.39	2.25	2.61	2.36	2.28	2.73	1.51	1.55
K_2O	*n.d.*	0.02	0.03	0.01	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01
Cr_2O_3	*n.d.*	0.04	0.03	0.02	*n.d.*	0.07	0.04	0.08	*n.d.*	*n.d.*	*n.d.*	0.03	*n.d.*
ZnO	0.01	0.01	0.02	*n.d.*	*n.d.*	0.01	0.02	0.04	0.02	*n.d.*	0.04	*n.d.*	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.27	99.36	96.58	99.33	98.96	99.74	99.46	99.16	99.56	99.63	99.48	99.61	98.94
Oxygens	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Si	1.95	1.92	1.94	1.93	1.93	1.90	1.91	1.92	1.91	1.91	1.92	1.96	1.90
Ti	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Al	0.11	0.22	0.14	0.20	0.20	0.25	0.23	0.24	0.22	0.25	0.27	0.12	0.20
Fe^{2+}	0.23	0.18	0.22	0.21	0.23	0.20	0.18	0.19	0.20	0.21	0.21	0.26	0.23
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.65	0.60	0.65	0.60	0.60	0.58	0.60	0.59	0.58	0.58	0.56	0.64	0.61
Ca	0.84	0.79	0.82	0.82	0.80	0.77	0.79	0.76	0.79	0.79	0.74	0.83	0.82
Na	0.11	0.17	0.12	0.14	0.15	0.17	0.16	0.19	0.17	0.16	0.20	0.11	0.11
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.10	0.10	0.09	0.09	0.09	0.11	0.12	0.11	0.11	0.08	0.10	0.07	0.11
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Mineral	Cpx	Amphibole											
Sample	SPF 03B	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Cpx 6.5	Hbl 1.1	Hbl 1.2	Hbl 1.3	Hbl 1.5	Hbl 1.6	Hbl 1.7	Hbl 1.8	Hbl 2.1	Hbl 2.2	Hbl 2.3	Hbl 2.4	Hbl 2.5
SiO_2	51.82	43.25	43.06	42.64	42.85	42.95	42.66	43.38	43.06	42.79	42.73	42.67	42.69
TiO_2	0.06	0.92	0.82	0.91	0.86	0.83	0.87	0.86	0.71	0.90	0.82	0.80	0.81
Al_2O_3	2.66	13.60	13.97	14.69	14.36	14.11	14.54	14.46	13.98	14.12	14.24	14.29	14.45
Fe*	11.22	15.93	15.79	15.86	15.95	15.55	15.80	16.18	15.62	15.70	15.70	15.62	15.92
MnO	0.15	0.09	0.11	0.07	0.11	0.09	0.08	0.12	0.12	0.09	0.10	0.09	0.08
MgO	11.06	10.46	10.23	9.96	10.16	10.24	10.01	9.77	10.14	10.19	10.30	10.35	10.02
CaO	21.00	11.78	11.88	11.76	11.84	11.84	11.75	11.84	11.90	12.01	11.87	11.74	12.05
Na_2O	1.50	1.89	1.92	1.98	1.99	1.89	2.04	1.88	1.86	1.92	2.04	1.96	1.83
K_2O	0.02	0.34	0.33	0.37	0.43	0.37	0.39	0.41	0.32	0.34	0.33	0.40	0.40
Cr_2O_3	*n.d.*	0.03	0.08	0.19	0.11	0.13	0.10	0.12	0.12	0.11	0.10	0.11	0.11
ZnO	*n.d.*	0.02	0.02	0.04	0.03	0.03	*n.d.*	0.02	0.03	*n.d.*	0.03	0.03	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.49	98.31	98.20	98.48	98.70	98.03	98.24	99.04	97.87	98.17	98.26	98.07	98.38
Oxygens	6.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	1.95	6.35	6.34	6.26	6.28	6.33	6.28	6.34	6.35	6.30	6.28	6.28	6.28
Ti	0.00	0.10	0.09	0.10	0.10	0.09	0.10	0.09	0.08	0.10	0.09	0.09	0.09
Al	0.12	2.35	2.42	2.54	2.48	2.45	2.52	2.49	2.43	2.45	2.47	2.48	2.50
Fe^{2+}	0.25	1.66	1.70	1.71	1.70	1.69	1.73	1.79	1.70	1.70	1.67	1.63	1.69
Mn	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Mg	0.62	2.29	2.24	2.18	2.22	2.25	2.20	2.13	2.23	2.24	2.26	2.27	2.20
Ca	0.85	1.85	1.87	1.85	1.86	1.87	1.85	1.85	1.88	1.90	1.87	1.85	1.90
Na	0.11	0.54	0.55	0.56	0.57	0.54	0.58	0.53	0.53	0.55	0.58	0.56	0.52
K	0.00	0.06	0.06	0.07	0.08	0.07	0.07	0.08	0.06	0.06	0.06	0.08	0.08
Cr	0.00	0.00	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fe^{3+}	0.10	0.29	0.24	0.24	0.25	0.23	0.21	0.19	0.22	0.23	0.26	0.29	0.27
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	15.52	15.54	15.55	15.57	15.54	15.58	15.52	15.53	15.56	15.57	15.56	15.54

Mineral							Amphibole						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Hbl 2.6	Hbl 2.7	Hbl 2.8	Hbl 2.10	Hbl 2.11	Hbl 2.12	Hbl 2.13	Hbl 2.18	Hbl 2.19	Hbl 3.1	Hbl 3.2	Hbl 3.3	Hbl 3.4
SiO_2	42.98	39.48	39.55	43.05	43.51	42.66	43.55	43.15	43.21	44.64	42.67	42.28	43.43
TiO_2	0.90	0.91	0.62	0.89	0.89	0.71	0.78	0.83	0.72	0.88	0.85	1.09	0.73
Al_2O_3	14.20	20.33	20.06	13.84	13.64	14.22	13.27	13.76	13.86	13.10	14.42	15.04	13.81
Fe*	15.83	17.45	17.64	16.02	15.61	15.96	15.46	15.96	16.10	13.56	14.57	14.96	15.12
MnO	0.10	0.10	0.11	0.11	0.10	0.10	0.08	0.10	0.08	0.06	0.09	0.08	0.10
MgO	10.08	6.81	7.22	10.43	10.43	9.86	10.53	10.34	10.28	11.72	10.79	10.69	11.13
CaO	11.86	12.03	11.82	12.05	12.08	11.92	12.22	11.99	11.90	12.12	11.95	11.78	11.66
Na_2O	1.99	1.26	1.35	1.87	1.78	2.00	1.77	2.01	1.88	1.68	1.99	2.10	2.03
K_2O	0.36	0.66	0.72	0.38	0.37	0.38	0.34	0.38	0.34	0.42	0.43	0.52	0.38
Cr_2O_3	0.10	0.03	*n.d.*	0.07	0.05	0.15	0.07	0.07	0.05	0.06	0.03	0.02	0.02
ZnO	0.02	*n.d.*	0.02	0.03	0.04	*n.d.*	*n.d.*	0.05	*n.d.*	0.03	0.05	0.03	0.04
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.42	99.05	99.10	98.73	98.50	97.95	98.07	98.64	98.42	98.27	97.85	98.60	98.46
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.32	5.79	5.79	6.30	6.38	6.31	6.41	6.33	6.34	6.49	6.28	6.18	6.34
Ti	0.10	0.10	0.07	0.10	0.10	0.08	0.09	0.09	0.08	0.10	0.09	0.12	0.08
Al	2.46	3.51	3.46	2.39	2.36	2.48	2.30	2.38	2.40	2.25	2.50	2.59	2.38
Fe^{2+}	1.75	1.81	1.70	1.64	1.69	1.78	1.70	1.72	1.68	1.51	1.57	1.56	1.52
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.21	1.49	1.58	2.28	2.28	2.18	2.31	2.26	2.25	2.54	2.37	2.33	2.42
Ca	1.87	1.89	1.85	1.89	1.90	1.89	1.93	1.89	1.87	1.89	1.88	1.85	1.82
Na	0.57	0.36	0.38	0.53	0.51	0.57	0.51	0.57	0.53	0.47	0.57	0.60	0.57
K	0.07	0.12	0.13	0.07	0.07	0.07	0.06	0.07	0.06	0.08	0.08	0.10	0.07
Cr	0.01	0.00	0.00	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Fe^{3+}	0.20	0.34	0.46	0.32	0.22	0.19	0.20	0.24	0.29	0.14	0.23	0.27	0.32
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.57	15.42	15.44	15.54	15.52	15.59	15.53	15.58	15.53	15.49	15.59	15.61	15.55

Mineral							Amphibole						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Hbl 3.5	Hbl 3.6	Hbl 3.7	Hbl 3.8	Hbl 3.9	Hbl 3.10	Hbl 3.11	Hbl 4.1	Hbl 4.2	Hbl 4.3	Hbl 4.4	Hbl 4.5	Hbl 4.6
SiO_2	42.52	43.04	42.68	43.76	43.16	43.53	43.11	43.21	43.28	43.10	42.87	42.24	43.98
TiO_2	0.77	0.91	0.72	0.85	0.89	0.90	0.83	0.89	0.79	0.71	0.82	0.89	0.87
Al_2O_3	14.68	14.32	14.65	13.32	14.04	13.70	13.85	14.06	14.27	14.84	15.13	16.07	13.10
Fe*	15.24	15.01	15.35	15.07	15.42	15.19	15.62	14.60	14.40	14.83	15.14	14.57	15.18
MnO	0.11	0.11	0.13	0.11	0.12	0.11	0.09	0.10	0.09	0.12	0.09	0.11	0.10
MgO	10.50	10.75	10.46	10.91	10.48	10.78	10.62	11.08	11.15	11.02	10.73	10.35	10.99
CaO	11.69	11.27	11.70	11.90	11.66	11.90	11.52	11.76	11.67	11.50	11.37	11.74	11.85
Na_2O	2.08	2.11	2.03	1.86	2.01	1.92	1.98	2.02	1.95	1.96	2.13	2.16	1.89
K_2O	0.68	0.61	0.44	0.40	0.41	0.47	0.46	0.54	0.74	0.79	0.83	0.63	0.46
Cr_2O_3	0.07	0.07	0.14	0.05	0.12	0.05	0.11	0.03	0.01	0.03	0.03	0.03	0.06
ZnO	0.04	0.01	0.03	*n.d.*	0.03	0.03	0.02	0.01	0.01	0.04	0.03	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.37	98.21	98.34	98.23	98.34	98.58	98.21	98.29	98.36	98.95	99.17	98.78	98.49
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.25	6.31	6.26	6.41	6.33	6.37	6.33	6.33	6.33	6.26	6.23	6.16	6.44
Ti	0.09	0.10	0.08	0.09	0.10	0.10	0.09	0.10	0.09	0.08	0.09	0.10	0.10
Al	2.54	2.47	2.53	2.30	2.43	2.36	2.40	2.43	2.46	2.54	2.59	2.76	2.26
Fe^{2+}	1.64	1.56	1.59	1.64	1.66	1.65	1.62	1.57	1.53	1.50	1.55	1.58	1.65
Mn	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.30	2.35	2.29	2.38	2.29	2.35	2.32	2.42	2.43	2.39	2.32	2.25	2.40
Ca	1.84	1.77	1.84	1.87	1.83	1.87	1.81	1.84	1.83	1.79	1.77	1.83	1.86
Na	0.59	0.60	0.58	0.53	0.57	0.54	0.56	0.57	0.55	0.55	0.60	0.61	0.54
K	0.13	0.11	0.08	0.08	0.08	0.09	0.09	0.10	0.14	0.15	0.15	0.12	0.09
Cr	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Fe^{3+}	0.24	0.28	0.29	0.21	0.23	0.21	0.30	0.22	0.23	0.30	0.29	0.20	0.20
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.63	15.57	15.57	15.53	15.56	15.56	15.55	15.59	15.59	15.58	15.61	15.62	15.55

Mineral							Amphibole						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Hbl 4.7	Hbl 4.8	Hbl 4.9	Hbl 4.10	Hbl 5.1	Hbl 5.2	Hbl 5.3	Hbl 5.4	Hbl 5.5	Hbl 6.1	Hbl 6.2	Hbl 6.3	Hbl 6.4
SiO_2	42.68	43.66	42.77	42.96	43.12	43.52	42.69	42.65	42.83	43.68	43.72	44.05	44.12
TiO_2	1.01	0.79	0.97	1.12	1.09	1.04	1.00	0.87	1.02	1.02	1.05	0.94	0.82
Al_2O_3	14.34	13.16	14.02	13.97	14.26	14.05	14.72	14.66	14.67	13.76	13.68	13.29	13.62
Fe*	15.51	15.11	15.69	15.59	15.05	14.86	15.08	15.45	15.08	15.06	14.69	14.91	14.43
MnO	0.10	0.11	0.12	0.09	0.10	0.11	0.13	0.11	0.10	0.10	0.07	0.09	0.09
MgO	10.56	11.06	10.49	10.53	10.64	10.62	10.54	10.44	10.51	11.02	11.02	11.04	11.37
CaO	11.69	11.82	11.71	11.58	11.79	11.86	11.90	11.67	11.87	11.84	11.89	11.91	11.92
Na_2O	1.92	1.94	2.03	1.93	1.96	1.91	2.02	2.03	1.96	1.92	1.86	1.76	1.89
K_2O	0.76	0.47	0.55	0.70	0.59	0.55	0.60	0.65	0.66	0.62	0.56	0.45	0.48
Cr_2O_3	0.03	0.01	0.12	0.10	0.05	0.04	0.04	0.08	0.05	0.05	0.08	0.04	0.06
ZnO	0.02	0.05	0.01	0.05	0.04	0.04	0.01	*n.d.*	*n.d.*	0.02	0.04	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.63	98.17	98.49	98.61	98.69	98.60	98.72	98.61	98.75	99.10	98.66	98.48	98.81
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.26	6.41	6.28	6.30	6.30	6.36	6.25	6.25	6.26	6.35	6.38	6.43	6.41
Ti	0.11	0.09	0.11	0.12	0.12	0.11	0.11	0.10	0.11	0.11	0.12	0.10	0.09
Al	2.48	2.28	2.43	2.41	2.46	2.42	2.54	2.53	2.53	2.36	2.35	2.29	2.33
Fe^{2+}	1.64	1.61	1.66	1.66	1.64	1.66	1.65	1.65	1.65	1.62	1.61	1.62	1.55
Mn	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.31	2.42	2.30	2.30	2.32	2.31	2.30	2.28	2.29	2.39	2.40	2.40	2.46
Ca	1.84	1.86	1.84	1.82	1.85	1.86	1.87	1.83	1.86	1.85	1.86	1.86	1.86
Na	0.55	0.55	0.58	0.55	0.56	0.54	0.57	0.58	0.56	0.54	0.53	0.50	0.53
K	0.14	0.09	0.10	0.13	0.11	0.10	0.11	0.12	0.12	0.12	0.10	0.08	0.09
Cr	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Fe^{3+}	0.27	0.24	0.26	0.25	0.20	0.16	0.20	0.25	0.19	0.22	0.18	0.20	0.20
Zn	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.60	15.56	15.60	15.58	15.58	15.55	15.61	15.61	15.60	15.57	15.55	15.51	15.54

Mineral							Amphibole						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Hbl 6.5	Hbl 6.6	Hbl 7.1	Hbl 7.2	Hbl 7.3	Hbl 7.4	Hbl 7.6	Hbl 7.7	Hbl 7.8	Hbl 7.9	Hbl 7.10	Hbl 7.11	Hbl 7.12
SiO_2	42.97	43.32	43.81	43.05	42.83	42.59	43.21	43.19	45.32	42.91	42.77	42.84	43.07
TiO_2	0.89	0.95	1.00	1.02	0.78	0.88	0.83	0.95	0.73	0.83	0.83	0.81	1.02
Al_2O_3	14.63	14.20	13.43	14.14	14.54	13.83	14.12	14.14	11.95	14.51	14.41	14.23	14.20
Fe*	14.25	14.45	14.68	15.26	15.00	14.73	15.15	15.08	14.64	15.26	15.63	15.01	15.70
MnO	0.09	0.08	0.10	0.12	0.10	0.11	0.10	0.08	0.08	0.09	0.09	0.10	0.11
MgO	11.02	11.22	11.26	10.87	10.95	10.86	10.88	10.90	11.57	10.54	10.65	10.76	10.47
CaO	11.76	11.84	11.62	11.88	11.75	11.92	11.61	11.76	12.18	11.72	11.77	11.77	11.75
Na_2O	1.99	1.92	1.91	1.95	1.97	1.92	1.94	1.94	1.42	1.97	2.06	1.96	1.95
K_2O	0.74	0.69	0.51	0.80	0.73	0.64	0.67	0.61	0.44	0.62	0.65	0.68	0.66
Cr_2O_3	0.09	0.04	0.08	0.05	0.08	0.05	0.04	0.04	0.06	0.06	0.05	0.07	0.08
ZnO	0.04	0.04	0.04	0.03	0.02	0.01	0.02	0.03	0.05	0.04	0.01	0.06	0.07
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.48	98.75	98.45	99.17	98.74	97.54	98.57	98.72	98.44	98.54	98.91	98.29	99.07
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.28	6.31	6.39	6.28	6.25	6.30	6.32	6.31	6.60	6.29	6.25	6.29	6.29
Ti	0.10	0.10	0.11	0.11	0.09	0.10	0.09	0.10	0.08	0.09	0.09	0.09	0.11
Al	2.52	2.44	2.31	2.43	2.50	2.41	2.43	2.43	2.05	2.50	2.48	2.46	2.44
Fe^{2+}	1.54	1.54	1.54	1.62	1.54	1.60	1.58	1.59	1.58	1.63	1.62	1.60	1.68
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.40	2.44	2.45	2.36	2.38	2.40	2.37	2.37	2.51	2.30	2.32	2.36	2.28
Ca	1.84	1.85	1.82	1.86	1.84	1.89	1.82	1.84	1.90	1.84	1.84	1.85	1.84
Na	0.56	0.54	0.54	0.55	0.56	0.55	0.55	0.55	0.40	0.56	0.58	0.56	0.55
K	0.14	0.13	0.09	0.15	0.14	0.12	0.13	0.11	0.08	0.12	0.12	0.13	0.12
Cr	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Fe^{3+}	0.20	0.22	0.25	0.24	0.29	0.23	0.27	0.25	0.21	0.23	0.29	0.24	0.24
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.61	15.59	15.53	15.62	15.61	15.61	15.58	15.58	15.43	15.59	15.62	15.61	15.59

Mineral							Amphibole						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Hbl 7.13	Hbl 7.14	Hbl 7.15	Hbl 8.1	Hbl 8.2	Hbl 8.3	Hbl 8.4	Hbl 8.5	Hbl 9.1	Hbl 9.2	Hbl 9.3	Hbl 9.4	Hbl 9.5
SiO_2	43.11	43.35	44.59	41.51	42.47	42.83	42.59	43.00	43.62	43.24	43.55	42.92	43.56
TiO_2	0.96	1.00	0.88	0.82	0.71	0.77	0.84	0.69	0.73	0.75	1.04	0.79	0.79
Al_2O_3	14.07	13.87	12.90	15.75	15.26	14.91	15.22	14.62	13.98	14.53	14.27	14.70	13.72
Fe*	15.53	15.02	14.90	15.11	14.50	14.34	14.33	14.43	14.48	14.52	14.19	14.72	14.72
MnO	0.10	0.11	0.08	0.14	0.09	0.11	0.09	0.12	0.10	0.07	0.08	0.08	0.10
MgO	10.73	10.63	11.21	10.21	10.88	11.13	10.85	11.16	11.40	11.01	11.32	11.11	11.04
CaO	11.72	11.77	11.99	11.83	12.00	11.79	11.91	12.00	11.89	12.10	12.01	12.15	11.65
Na_2O	2.06	1.81	1.65	1.98	2.01	1.88	2.04	2.01	1.93	2.00	2.05	1.94	2.04
K_2O	0.64	0.52	0.45	0.67	0.62	0.68	0.72	0.56	0.52	0.48	0.53	0.47	0.56
Cr_2O_3	0.04	0.06	0.09	0.03	0.04	0.05	0.09	0.09	0.08	0.05	0.06	0.05	0.04
ZnO	0.02	0.06	*n.d.*	0.01	*n.d.*	*n.d.*	0.02	0.04	0.06	0.05	0.04	0.01	0.05
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.99	98.20	98.75	98.08	98.59	98.49	98.71	98.71	98.79	98.80	99.14	98.94	98.27
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.30	6.36	6.49	6.11	6.20	6.24	6.22	6.26	6.34	6.30	6.32	6.24	6.38
Ti	0.11	0.11	0.10	0.09	0.08	0.08	0.09	0.08	0.08	0.08	0.11	0.09	0.09
Al	2.42	2.40	2.21	2.73	2.63	2.56	2.62	2.51	2.39	2.49	2.44	2.52	2.37
Fe^{2+}	1.65	1.64	1.61	1.55	1.51	1.46	1.56	1.49	1.48	1.56	1.55	1.47	1.59
Mn	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.34	2.33	2.43	2.24	2.37	2.42	2.36	2.42	2.47	2.39	2.45	2.41	2.41
Ca	1.83	1.85	1.87	1.87	1.88	1.84	1.86	1.87	1.85	1.89	1.87	1.89	1.83
Na	0.58	0.51	0.47	0.57	0.57	0.53	0.58	0.57	0.54	0.56	0.58	0.55	0.58
K	0.12	0.10	0.08	0.13	0.12	0.13	0.13	0.10	0.10	0.09	0.10	0.09	0.10
Cr	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fe^{3+}	0.25	0.21	0.20	0.31	0.26	0.29	0.19	0.27	0.28	0.21	0.18	0.32	0.22
Zn	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.61	15.53	15.48	15.62	15.62	15.57	15.64	15.60	15.56	15.59	15.60	15.58	15.58

Mineral						Amphibole							
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Hbl 9.6	Hbl 9.8	Hbl 9.9	Hbl 9.10	Hbl 9.11	Hbl 9.12	Hbl 9.13	Hbl 9.14	Hbl 10.1	Hbl 10.2	Hbl 10.3	Hbl 10.4	Hbl 10.5
SiO_2	43.50	43.94	43.53	43.67	43.95	44.02	43.54	43.29	42.65	41.95	42.35	42.60	43.04
TiO_2	0.98	0.76	1.07	0.82	0.99	0.83	0.85	0.94	0.72	0.92	0.92	0.90	0.71
Al_2O_3	14.10	13.68	13.94	13.26	13.29	13.41	13.65	13.92	15.58	15.83	15.39	15.42	14.43
Fe*	14.67	14.36	14.72	14.50	14.55	14.38	14.65	14.57	14.98	15.00	14.55	14.52	14.56
MnO	0.07	0.10	0.09	0.09	0.08	0.09	0.09	0.12	0.09	0.13	0.09	0.10	0.12
MgO	11.08	11.49	11.09	11.29	11.44	11.31	11.35	11.21	10.55	10.46	10.70	10.70	11.12
CaO	11.78	11.60	11.86	11.43	12.01	12.07	11.98	11.89	11.87	11.90	11.93	11.70	11.77
Na_2O	1.99	2.02	1.98	1.92	1.81	1.74	1.87	1.96	1.88	2.09	1.97	2.05	1.98
K_2O	0.64	0.51	0.46	0.45	0.44	0.44	0.47	0.65	0.58	0.67	0.60	0.66	0.70
Cr_2O_3	0.06	0.05	0.07	0.08	0.09	0.07	0.04	0.08	0.07	0.07	0.07	0.07	0.09
ZnO	0.03	0.04	0.07	0.02	0.01	*n.d.*	0.04	0.05	0.04	0.05	0.04	0.05	0.05
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.90	98.56	98.89	97.53	98.65	98.37	98.53	98.69	99.01	99.07	98.61	98.77	98.57
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.33	6.39	6.34	6.42	6.40	6.42	6.35	6.32	6.20	6.11	6.18	6.21	6.28
Ti	0.11	0.08	0.12	0.09	0.11	0.09	0.09	0.10	0.08	0.10	0.10	0.10	0.08
Al	2.42	2.35	2.39	2.30	2.28	2.31	2.35	2.39	2.67	2.72	2.65	2.65	2.48
Fe^{2+}	1.58	1.49	1.58	1.51	1.53	1.55	1.50	1.55	1.52	1.55	1.53	1.54	1.52
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01
Mg	2.40	2.49	2.41	2.47	2.48	2.46	2.47	2.44	2.28	2.27	2.33	2.32	2.42
Ca	1.84	1.81	1.85	1.80	1.87	1.89	1.87	1.86	1.85	1.86	1.87	1.83	1.84
Na	0.56	0.57	0.56	0.55	0.51	0.49	0.53	0.55	0.53	0.59	0.56	0.58	0.56
K	0.12	0.09	0.09	0.08	0.08	0.08	0.09	0.12	0.11	0.12	0.11	0.12	0.13
Cr	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fe^{3+}	0.21	0.26	0.22	0.27	0.24	0.21	0.29	0.22	0.30	0.28	0.25	0.23	0.26
Zn	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.58	15.55	15.56	15.52	15.52	15.51	15.55	15.60	15.56	15.64	15.60	15.60	15.61

Mineral							Amphibole						
Sample	SPF 01A2	SPF 01A2	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Hbl 10.6	Hbl 10.7	Hbl 1.1	Hbl 1.2	Hbl 1.3	Hbl 1.4	Hbl 1.5	Hbl 1.6	Hbl 1.7	Hbl 1.8	Hbl 1.9	Hbl 1.10	Hbl 1.11
SiO_2	43.02	42.50	43.51	42.88	43.12	43.13	43.51	43.23	42.80	43.07	43.04	43.07	43.38
TiO_2	0.93	1.09	0.57	0.80	0.86	0.81	0.74	1.00	1.44	1.01	0.85	1.06	1.05
Al_2O_3	14.65	14.83	14.01	14.84	14.43	14.14	13.87	14.28	13.91	13.89	14.05	14.61	14.36
Fe*	14.25	13.92	14.49	14.88	14.87	14.63	14.31	14.38	14.93	15.08	14.92	14.79	14.59
MnO	0.09	0.10	0.06	0.10	0.09	0.08	0.07	0.09	0.09	0.08	0.08	0.08	0.08
MgO	11.14	10.97	10.98	10.87	10.78	11.07	11.33	11.08	10.54	10.62	10.93	10.69	10.69
CaO	11.84	11.81	12.22	11.74	11.94	11.90	11.87	11.90	12.02	12.21	12.16	12.25	12.00
Na_2O	2.00	2.05	1.71	1.90	1.90	1.79	1.91	1.88	1.77	1.70	1.73	1.81	1.70
K_2O	0.69	0.78	0.78	0.91	0.87	0.78	0.77	0.81	0.82	0.86	0.84	0.89	0.83
Cr_2O_3	0.05	0.10	0.10	0.05	0.05	0.25	0.21	0.21	0.27	0.04	0.05	0.08	0.07
ZnO	0.01	0.01	0.01	0.01	0.03	0.02	0.06	0.02	0.02	0.03	0.03	*n.d.*	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.67	98.15	98.45	98.98	98.95	98.60	98.65	98.88	98.60	98.58	98.68	99.32	98.79
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.27	6.24	6.37	6.25	6.30	6.30	6.35	6.30	6.29	6.33	6.30	6.27	6.33
Ti	0.10	0.12	0.06	0.09	0.09	0.09	0.08	0.11	0.16	0.11	0.09	0.12	0.12
Al	2.52	2.56	2.42	2.55	2.48	2.43	2.39	2.45	2.41	2.40	2.42	2.51	2.47
Fe^{2+}	1.53	1.55	1.61	1.57	1.64	1.54	1.54	1.57	1.70	1.70	1.59	1.68	1.64
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.42	2.40	2.40	2.36	2.35	2.41	2.46	2.41	2.31	2.33	2.38	2.32	2.33
Ca	1.85	1.86	1.92	1.83	1.87	1.86	1.86	1.86	1.89	1.92	1.91	1.91	1.88
Na	0.57	0.58	0.49	0.54	0.54	0.51	0.54	0.53	0.50	0.48	0.49	0.51	0.48
K	0.13	0.15	0.15	0.17	0.16	0.15	0.14	0.15	0.15	0.16	0.16	0.16	0.15
Cr	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.02	0.03	0.00	0.01	0.01	0.01
Fe^{3+}	0.21	0.16	0.17	0.25	0.18	0.25	0.20	0.19	0.13	0.16	0.24	0.12	0.14
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.61	15.64	15.59	15.62	15.63	15.58	15.61	15.60	15.59	15.60	15.60	15.63	15.56

Mineral							Amphibole						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Hbl 1.12	Hbl 1.13	Hbl 1.14	Hbl 1.15	Hbl 2.1	Hbl 2.2	Hbl 2.3	Hbl 2.6	Hbl 2.7	Hbl 2.8	Hbl 2.9	Hbl 3.1	Hbl 3.2
SiO_2	43.28	42.09	42.41	42.65	43.76	43.77	44.96	44.21	43.95	44.00	43.69	42.36	42.46
TiO_2	1.11	0.61	0.79	0.68	0.74	0.71	0.84	0.92	0.78	0.62	0.74	1.03	0.73
Al_2O_3	14.31	15.98	15.41	15.41	14.95	14.28	13.29	13.30	14.42	14.00	14.39	15.79	15.52
Fe*	14.47	14.88	14.57	15.02	12.69	12.90	12.39	13.14	12.87	12.72	13.06	13.83	13.48
MnO	0.10	0.09	0.09	0.10	0.08	0.06	0.07	0.07	0.09	0.08	0.06	0.07	0.09
MgO	10.80	10.22	10.64	10.50	12.01	12.28	12.90	12.31	12.30	12.38	12.03	11.07	11.31
CaO	12.00	12.06	12.03	11.97	11.83	11.73	11.94	11.86	11.85	11.66	11.70	11.70	11.93
Na_2O	1.76	1.86	1.84	1.88	1.96	1.93	1.93	1.82	1.89	1.81	1.93	1.98	1.95
K_2O	0.77	0.89	0.79	0.82	0.88	0.85	0.59	0.67	0.85	0.79	0.90	0.86	0.82
Cr_2O_3	0.14	0.08	0.03	0.09	0.06	*n.d.*	0.02	0.06	0.03	0.05	0.03	0.11	0.08
ZnO	0.05	0.03	0.04	0.02	0.04	0.05	*n.d.*	0.03	*n.d.*	0.01	0.02	*n.d.*	0.06
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.78	98.79	98.64	99.14	99.00	98.56	98.94	98.39	99.04	98.11	98.56	98.80	98.43
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.32	6.16	6.20	6.21	6.31	6.34	6.46	6.42	6.33	6.38	6.33	6.16	6.19
Ti	0.12	0.07	0.09	0.07	0.08	0.08	0.09	0.10	0.08	0.07	0.08	0.11	0.08
Al	2.46	2.75	2.65	2.64	2.54	2.44	2.25	2.28	2.45	2.39	2.46	2.70	2.67
Fe^{2+}	1.62	1.61	1.55	1.59	1.34	1.32	1.29	1.38	1.32	1.28	1.36	1.45	1.41
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.35	2.23	2.32	2.28	2.58	2.65	2.76	2.66	2.64	2.68	2.60	2.40	2.46
Ca	1.88	1.89	1.88	1.87	1.83	1.82	1.84	1.84	1.83	1.81	1.82	1.82	1.86
Na	0.50	0.53	0.52	0.53	0.55	0.54	0.54	0.51	0.53	0.51	0.54	0.56	0.55
K	0.14	0.17	0.15	0.15	0.16	0.16	0.11	0.12	0.16	0.15	0.17	0.16	0.15
Cr	0.02	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01
Fe^{3+}	0.15	0.21	0.23	0.23	0.19	0.24	0.20	0.22	0.23	0.26	0.22	0.24	0.23
Zn	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.57	15.63	15.61	15.61	15.60	15.59	15.55	15.55	15.59	15.55	15.60	15.61	15.63

Mineral							Amphibole						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Hbl 3.3	Hbl 3.4	Hbl 3.8	Hbl 3.9	Hbl 3.10	Hbl 3.11	Hbl 4.1	Hbl 4.2	Hbl 4.3	Hbl 5.1	Hbl 5.2	Hbl 5.4	Hbl 5.5
SiO_2	41.82	40.25	41.89	42.49	42.52	35.06	42.12	42.18	41.73	42.47	42.89	43.29	44.69
TiO_2	1.02	1.01	0.58	1.01	0.79	0.60	1.01	0.90	0.77	0.50	0.51	0.59	0.52
Al_2O_3	15.87	18.28	14.48	15.70	15.84	14.30	15.90	15.72	15.91	16.16	15.20	14.86	13.40
Fe*	14.06	14.72	16.25	14.25	14.41	18.76	14.10	14.38	14.08	14.67	14.57	14.52	14.05
MnO	0.07	0.10	0.10	0.10	0.08	0.14	0.13	0.12	0.11	0.16	0.14	0.14	0.14
MgO	10.84	9.49	10.38	10.80	10.80	12.47	11.09	10.77	10.94	10.39	10.63	10.86	11.55
CaO	11.86	11.83	10.74	11.82	11.81	7.22	11.37	11.08	11.40	11.96	11.70	11.78	12.15
Na_2O	2.01	2.16	1.83	1.90	1.94	1.24	2.00	2.20	1.96	1.89	1.84	1.76	1.63
K_2O	0.89	1.07	0.91	0.90	0.93	0.67	0.93	1.01	1.04	0.82	0.80	0.66	0.58
Cr_2O_3	0.05	0.06	0.11	0.04	*n.d.*	0.09	0.03	0.03	0.02	*n.d.*	0.02	0.06	0.03
ZnO	0.01	*n.d.*	0.02	*n.d.*	0.05	0.05	0.04	0.03	*n.d.*	0.02	0.05	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.50	98.97	97.29	99.01	99.18	90.61	98.72	98.41	97.97	99.03	98.34	98.52	98.75
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.12	5.90	6.21	6.18	6.17	5.50	6.12	6.16	6.12	6.18	6.27	6.31	6.48
Ti	0.11	0.11	0.06	0.11	0.09	0.07	0.11	0.10	0.09	0.05	0.06	0.06	0.06
Al	2.74	3.16	2.53	2.69	2.71	2.65	2.72	2.71	2.75	2.77	2.62	2.55	2.29
Fe^{2+}	1.51	1.62	1.49	1.52	1.52	0.48	1.39	1.46	1.42	1.56	1.55	1.52	1.52
Mn	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02
Mg	2.36	2.07	2.29	2.34	2.34	2.92	2.40	2.35	2.39	2.25	2.32	2.36	2.50
Ca	1.86	1.86	1.71	1.84	1.84	1.21	1.77	1.73	1.79	1.86	1.83	1.84	1.89
Na	0.57	0.61	0.53	0.54	0.55	0.38	0.56	0.62	0.56	0.53	0.52	0.50	0.46
K	0.17	0.20	0.17	0.17	0.17	0.13	0.17	0.19	0.19	0.15	0.15	0.12	0.11
Cr	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Fe^{3+}	0.21	0.18	0.53	0.21	0.23	1.98	0.33	0.30	0.31	0.22	0.23	0.25	0.18
Zn	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.66	15.73	15.54	15.61	15.63	15.36	15.61	15.64	15.64	15.61	15.58	15.53	15.51

Mineral							Amphibole						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Hbl 5.6	Hbl 5.7	Hbl 5.8	Hbl 5.9	Hbl 5.10	Hbl 5.11	Hbl 5.12	Hbl 5.13	Hbl 5.14	Hbl 5.16	Hbl 5.17	Hbl 6.1	Hbl 6.2
SiO_2	46.27	43.96	44.23	42.96	42.94	43.33	43.96	43.56	45.43	41.65	42.71	40.03	43.19
TiO_2	0.40	0.46	0.52	0.52	0.73	0.83	0.42	0.54	0.33	0.57	0.35	0.42	0.52
Al_2O_3	11.64	12.82	14.21	15.53	14.77	14.71	13.88	13.92	12.57	16.73	15.14	17.04	15.27
Fe*	13.58	15.43	14.08	15.00	14.66	14.93	14.50	14.41	13.26	15.14	14.51	15.70	14.37
MnO	0.12	0.13	0.17	0.12	0.13	0.14	0.13	0.17	0.13	0.19	0.15	0.16	0.15
MgO	12.56	11.24	11.21	10.58	10.98	10.92	11.20	10.99	12.16	9.87	11.11	8.98	10.94
CaO	12.34	11.61	12.29	11.79	11.86	11.97	12.06	12.13	12.23	11.79	11.98	11.21	11.82
Na_2O	1.27	1.59	1.53	1.90	1.93	1.85	1.61	1.58	1.47	1.94	1.89	1.70	1.96
K_2O	0.51	0.57	0.67	0.77	0.78	0.72	0.68	0.70	0.54	0.93	0.75	0.79	0.73
Cr_2O_3	0.03	0.02	0.05	0.03	0.03	0.04	0.03	0.06	0.03	0.04	0.04	0.04	0.02
ZnO	0.02	0.05	0.03	0.02	0.02	0.03	0.03	*n.d.*	0.03	*n.d.*	0.01	0.04	0.04
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.73	97.88	98.99	99.21	98.83	99.48	98.49	98.07	98.18	98.85	98.64	96.10	99.00
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.67	6.44	6.41	6.24	6.26	6.27	6.40	6.38	6.59	6.09	6.22	6.01	6.27
Ti	0.04	0.05	0.06	0.06	0.08	0.09	0.05	0.06	0.04	0.06	0.04	0.05	0.06
Al	1.98	2.21	2.43	2.66	2.54	2.51	2.38	2.40	2.15	2.88	2.60	3.02	2.61
Fe^{2+}	1.39	1.47	1.52	1.56	1.54	1.55	1.51	1.54	1.44	1.61	1.42	1.55	1.51
Mn	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Mg	2.70	2.46	2.42	2.29	2.39	2.36	2.43	2.40	2.63	2.15	2.41	2.01	2.37
Ca	1.91	1.82	1.91	1.83	1.85	1.86	1.88	1.90	1.90	1.85	1.87	1.80	1.84
Na	0.35	0.45	0.43	0.53	0.55	0.52	0.45	0.45	0.41	0.55	0.53	0.50	0.55
K	0.09	0.11	0.12	0.14	0.15	0.13	0.13	0.13	0.10	0.17	0.14	0.15	0.13
Cr	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.25	0.42	0.19	0.26	0.25	0.25	0.26	0.22	0.17	0.24	0.34	0.42	0.23
Zn	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.40	15.46	15.50	15.59	15.61	15.58	15.52	15.53	15.46	15.64	15.60	15.54	15.60

Mineral						Amphibole							
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Hbl 6.4	Hbl 6.5	Hbl 6.6	Hbl 6.7	Hbl 6.8	Hbl 6.9	Hbl 6.10	Hbl 6.11	Hbl 6.12	Hbl 6.13	Hbl 6.14	Hbl 6.15	Hbl 6.16
SiO_2	44.05	44.50	44.21	43.98	44.18	43.96	44.41	44.47	46.02	45.51	46.24	45.88	45.71
TiO_2	0.51	0.53	0.69	0.57	0.69	0.72	0.64	0.83	0.74	0.73	0.61	0.84	0.75
Al_2O_3	14.14	13.59	13.80	14.11	13.51	14.00	13.14	13.20	11.95	12.14	11.65	12.42	12.24
Fe*	14.23	14.23	14.12	14.58	14.67	14.56	13.37	13.59	12.16	12.36	12.11	12.08	12.20
MnO	0.10	0.16	0.12	0.16	0.17	0.16	0.09	0.13	0.08	0.10	0.09	0.08	0.08
MgO	11.49	11.01	11.28	11.02	11.47	11.05	12.17	12.05	13.30	13.21	13.30	13.24	13.13
CaO	12.04	12.19	12.00	12.02	12.09	11.80	11.78	11.82	12.14	11.90	11.82	12.33	12.10
Na_2O	1.70	1.52	1.55	1.77	1.71	1.82	1.90	1.88	1.71	1.79	1.66	1.48	1.56
K_2O	0.67	0.69	0.63	0.70	0.61	0.61	0.62	0.58	0.54	0.61	0.54	0.63	0.58
Cr_2O_3	0.04	0.10	0.05	0.11	0.07	0.06	0.09	0.09	0.07	0.09	0.12	0.05	0.09
ZnO	*n.d.*	0.03	*n.d.*	0.06	0.04	*n.d.*	*n.d.*	*n.d.*	0.03	0.06	0.02	0.01	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.97	98.56	98.46	99.08	99.21	98.74	98.21	98.64	98.75	98.49	98.17	99.04	98.44
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.38	6.49	6.43	6.39	6.39	6.39	6.46	6.45	6.61	6.56	6.67	6.57	6.59
Ti	0.06	0.06	0.08	0.06	0.07	0.08	0.07	0.09	0.08	0.08	0.07	0.09	0.08
Al	2.41	2.33	2.37	2.42	2.30	2.40	2.25	2.26	2.02	2.06	1.98	2.10	2.08
Fe^{2+}	1.46	1.62	1.52	1.59	1.49	1.56	1.41	1.43	1.31	1.28	1.27	1.29	1.29
Mn	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Mg	2.48	2.39	2.45	2.39	2.47	2.40	2.64	2.60	2.85	2.84	2.86	2.83	2.82
Ca	1.87	1.90	1.87	1.87	1.87	1.84	1.84	1.84	1.87	1.84	1.83	1.89	1.87
Na	0.48	0.43	0.44	0.50	0.48	0.51	0.54	0.53	0.48	0.50	0.46	0.41	0.44
K	0.12	0.13	0.12	0.13	0.11	0.11	0.11	0.11	0.10	0.11	0.10	0.11	0.11
Cr	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fe^{3+}	0.26	0.12	0.20	0.18	0.29	0.21	0.22	0.22	0.16	0.21	0.19	0.16	0.18
Zn	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.53	15.50	15.48	15.56	15.53	15.53	15.56	15.54	15.50	15.52	15.45	15.47	15.47

Mineral							Amphibole						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Hbl 6.17	Hbl 6.18	Hbl 7.1	Hbl 7.2	Hbl 7.3	Hbl 7.4	Hbl 7.5	Hbl 7.6	Hbl 7.7	Hbl 7.8	Hbl 7.9	Hbl 7.10	Hbl 7.11
SiO_2	44.06	45.53	42.10	42.99	42.71	43.77	43.86	45.56	44.60	44.67	44.49	44.64	44.63
TiO_2	0.84	0.76	0.52	0.33	0.61	0.68	0.38	0.77	0.96	0.80	0.88	0.77	0.80
Al_2O_3	13.65	12.34	15.48	14.46	14.26	13.48	13.53	12.91	13.54	13.45	13.38	13.28	13.51
Fe*	12.61	12.27	15.95	15.76	15.78	15.23	15.17	11.66	12.18	12.20	12.63	12.50	12.59
MnO	0.07	0.07	0.26	0.22	0.18	0.20	0.22	0.05	0.07	0.07	0.08	0.10	0.08
MgO	12.38	13.13	9.55	10.17	10.59	10.83	10.83	13.55	12.79	12.98	12.60	12.75	12.68
CaO	11.92	12.10	11.81	11.83	11.71	11.93	11.89	12.09	11.70	11.69	11.68	11.61	11.65
Na_2O	1.88	1.69	1.85	1.93	2.05	1.83	1.80	1.77	1.91	1.90	1.83	1.85	1.89
K_2O	0.72	0.63	0.65	0.59	0.52	0.49	0.49	0.62	0.87	0.87	0.82	0.88	0.82
Cr_2O_3	0.04	0.08	0.07	0.04	0.05	0.07	0.05	0.08	0.12	0.07	0.14	0.13	0.10
ZnO	*n.d.*	0.03	0.03	0.04	0.03	0.02	0.05	0.05	0.01	*n.d.*	0.03	0.01	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.17	98.64	98.27	98.36	98.48	98.54	98.25	99.10	98.75	98.71	98.55	98.51	98.76
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.40	6.56	6.21	6.32	6.26	6.40	6.42	6.51	6.42	6.43	6.43	6.45	6.43
Ti	0.09	0.08	0.06	0.04	0.07	0.08	0.04	0.08	0.10	0.09	0.10	0.08	0.09
Al	2.34	2.10	2.69	2.51	2.46	2.32	2.34	2.17	2.30	2.28	2.28	2.26	2.29
Fe^{2+}	1.35	1.30	1.70	1.68	1.57	1.62	1.59	1.19	1.27	1.24	1.30	1.27	1.28
Mn	0.01	0.01	0.03	0.03	0.02	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.68	2.82	2.10	2.23	2.31	2.36	2.36	2.89	2.75	2.79	2.71	2.75	2.72
Ca	1.86	1.87	1.87	1.86	1.84	1.87	1.87	1.85	1.81	1.80	1.81	1.80	1.80
Na	0.53	0.47	0.53	0.55	0.58	0.52	0.51	0.49	0.53	0.53	0.51	0.52	0.53
K	0.13	0.12	0.12	0.11	0.10	0.09	0.09	0.11	0.16	0.16	0.15	0.16	0.15
Cr	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01
Fe^{3+}	0.18	0.17	0.27	0.26	0.36	0.24	0.27	0.20	0.20	0.23	0.23	0.24	0.24
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.58	15.51	15.58	15.59	15.59	15.54	15.53	15.52	15.56	15.57	15.55	15.55	15.55

Mineral							Amphibole						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Hbl 7.12	Hbl 7.13	Hbl 7.14	Hbl 7.15	Hbl 7.16	Hbl 7.17	Hbl 8.1	Hbl 8.2	Hbl 8.3	Hbl 9.1	Hbl 9.2	Hbl 9.3	Hbl 9.4
SiO_2	45.00	43.62	43.80	43.58	43.40	42.78	39.92	40.11	40.76	43.81	43.84	44.15	44.53
TiO_2	0.83	0.35	0.65	0.66	0.56	0.62	0.03	*n.d.*	0.08	0.85	0.89	0.79	0.55
Al_2O_3	12.82	14.39	13.49	14.03	14.41	15.08	16.68	16.74	16.37	14.82	15.05	14.56	14.64
Fe*	12.80	14.48	13.73	13.49	14.25	13.76	21.32	21.08	21.09	12.13	12.05	11.99	12.02
MnO	0.07	0.13	0.11	0.12	0.11	0.12	0.14	0.17	0.16	0.06	0.10	0.06	0.07
MgO	12.73	10.96	11.55	11.65	11.55	11.16	6.10	6.26	6.31	12.52	12.43	12.67	12.73
CaO	11.99	12.10	11.88	11.96	11.58	11.91	11.70	11.66	11.52	11.77	11.47	11.55	11.54
Na_2O	1.74	1.60	1.81	1.72	1.81	1.73	1.34	1.26	1.33	1.94	2.06	2.01	2.03
K_2O	0.69	0.86	0.74	0.77	0.84	0.85	1.58	1.71	1.40	0.84	0.94	0.87	0.89
Cr_2O_3	0.15	0.07	0.09	0.06	0.05	0.20	0.03	0.02	0.01	0.07	0.06	0.08	0.04
ZnO	0.07	0.03	0.04	0.03	0.02	0.04	0.01	*n.d.*	*n.d.*	*n.d.*	0.04	0.02	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.88	98.58	97.89	98.08	98.58	98.24	98.85	99.02	99.03	98.82	98.93	98.75	99.08
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.49	6.36	6.42	6.36	6.31	6.25	6.01	6.02	6.10	6.30	6.30	6.35	6.37
Ti	0.09	0.04	0.07	0.07	0.06	0.07	0.00	0.00	0.01	0.09	0.10	0.09	0.06
Al	2.18	2.47	2.33	2.41	2.47	2.60	2.96	2.96	2.89	2.51	2.55	2.47	2.47
Fe^{2+}	1.34	1.54	1.51	1.44	1.40	1.43	2.25	2.22	2.24	1.24	1.21	1.21	1.20
Mn	0.01	0.02	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Mg	2.74	2.38	2.52	2.54	2.50	2.43	1.37	1.40	1.41	2.69	2.66	2.72	2.72
Ca	1.85	1.89	1.87	1.87	1.80	1.86	1.89	1.88	1.85	1.81	1.77	1.78	1.77
Na	0.49	0.45	0.51	0.49	0.51	0.49	0.39	0.37	0.39	0.54	0.57	0.56	0.56
K	0.13	0.16	0.14	0.14	0.16	0.16	0.30	0.33	0.27	0.15	0.17	0.16	0.16
Cr	0.02	0.01	0.01	0.01	0.01	0.02	0.00	0.00	0.00	0.01	0.01	0.01	0.00
Fe^{3+}	0.20	0.22	0.18	0.21	0.33	0.25	0.43	0.43	0.40	0.22	0.23	0.23	0.24
Zn	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.53	15.55	15.58	15.56	15.56	15.57	15.64	15.63	15.57	15.58	15.58	15.57	15.57

Mineral							Amphibole						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 9.5	Hbl 10.1	Hbl 10.2	Hbl 10.3	Hbl 10.4	Hbl 10.5	Hbl 1.1	Hbl 1.2	Hbl 1.3	Hbl 1.4	Hbl 1.5	Hbl 1.6	Hbl 1.7
SiO_2	44.40	43.14	43.63	43.75	44.30	43.40	46.65	47.27	46.00	45.66	46.10	46.10	45.19
TiO_2	0.92	0.76	0.77	0.82	0.83	0.74	0.58	0.55	0.65	0.91	0.91	0.97	0.78
Al_2O_3	14.27	15.31	15.18	15.04	14.91	15.23	10.65	10.36	11.15	11.05	10.66	10.96	11.74
Fe*	12.08	12.95	12.77	12.63	12.05	12.75	11.03	11.06	11.43	12.01	11.93	12.00	11.94
MnO	0.08	0.07	0.08	0.08	0.09	0.07	0.03	0.05	0.06	0.05	0.03	0.05	0.06
MgO	12.80	11.92	12.11	12.25	12.44	12.03	15.09	15.23	14.48	14.11	14.28	14.20	13.97
CaO	11.59	11.84	11.73	11.75	11.76	11.71	11.63	11.43	11.50	11.91	11.68	11.81	11.72
Na_2O	1.97	1.89	1.99	1.93	2.02	1.96	1.96	1.99	2.05	2.01	2.04	2.10	2.22
K_2O	0.82	0.87	0.90	0.86	0.87	0.95	0.22	0.36	0.19	0.21	0.19	0.18	0.19
Cr_2O_3	0.07	0.04	0.02	*n.d.*	0.05	*n.d.*	0.09	0.09	0.04	0.06	0.07	0.05	0.12
ZnO	0.03	0.04	0.04	*n.d.*	0.03	0.04	0.01	*n.d.*	0.02	*n.d.*	0.01	0.03	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.03	98.83	99.22	99.11	99.33	98.88	97.94	98.39	97.58	97.98	97.90	98.44	97.95
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.36	6.24	6.27	6.29	6.34	6.26	6.68	6.74	6.63	6.59	6.65	6.62	6.53
Ti	0.10	0.08	0.08	0.09	0.09	0.08	0.06	0.06	0.07	0.10	0.10	0.10	0.08
Al	2.41	2.61	2.57	2.55	2.51	2.59	1.80	1.74	1.89	1.88	1.81	1.86	2.00
Fe^{2+}	1.20	1.32	1.30	1.28	1.26	1.31	0.97	0.98	1.05	1.16	1.16	1.18	1.14
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01
Mg	2.73	2.57	2.60	2.62	2.65	2.59	3.22	3.24	3.11	3.04	3.07	3.04	3.01
Ca	1.78	1.83	1.81	1.81	1.80	1.81	1.78	1.75	1.78	1.84	1.81	1.82	1.81
Na	0.55	0.53	0.55	0.54	0.56	0.55	0.54	0.55	0.57	0.56	0.57	0.59	0.62
K	0.15	0.16	0.17	0.16	0.16	0.17	0.04	0.06	0.04	0.04	0.03	0.03	0.04
Cr	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fe^{3+}	0.25	0.24	0.23	0.24	0.18	0.23	0.35	0.34	0.33	0.29	0.28	0.26	0.30
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.55	15.60	15.60	15.58	15.58	15.61	15.47	15.47	15.49	15.52	15.50	15.52	15.56

Mineral							Amphibole						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 1.8	Hbl 1.9	Hbl 1.10	Hbl 1.11	Hbl 1.13	Hbl 1.12	Hbl 1.20	Hbl 1.14	Hbl 1.15	Hbl 1.16	Hbl 1.17	Hbl 1.18	Hbl 1.19
SiO_2	45.91	46.25	44.74	44.57	45.51	45.83	45.23	44.62	44.36	45.07	45.87	44.68	44.35
TiO_2	0.80	0.70	0.70	0.77	0.59	0.73	0.59	1.06	1.02	0.96	0.84	0.82	0.94
Al_2O_3	11.05	10.93	12.21	12.57	11.62	11.09	11.93	12.17	12.42	11.93	11.27	12.41	12.75
Fe*	11.45	11.63	11.99	12.05	11.83	11.74	11.82	12.01	12.10	11.70	11.15	11.67	11.93
MnO	0.03	0.04	0.03	0.07	0.04	0.03	0.04	0.05	0.03	0.04	0.04	0.03	0.02
MgO	14.23	14.39	13.93	13.87	14.10	14.14	14.14	13.73	13.82	14.14	14.65	13.92	13.68
CaO	11.52	11.65	11.57	11.71	11.68	11.82	11.81	11.77	11.81	11.77	12.05	11.97	11.75
Na_2O	2.03	2.08	2.22	2.28	2.03	2.08	2.17	2.26	2.36	2.29	2.01	2.31	2.34
K_2O	0.30	0.22	0.24	0.27	0.20	0.21	0.21	0.26	0.24	0.29	0.25	0.25	0.23
Cr_2O_3	0.04	0.04	0.11	0.06	0.10	0.08	0.13	0.07	0.08	0.04	0.08	0.06	0.11
ZnO	0.04	0.06	0.04	0.02	0.02	*n.d.*	0.03	0.03	0.01	0.02	0.02	0.01	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.39	97.98	97.78	98.24	97.72	97.74	98.09	98.03	98.25	98.24	98.22	98.13	98.11
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.65	6.66	6.47	6.42	6.57	6.63	6.51	6.46	6.41	6.50	6.58	6.45	6.41
Ti	0.09	0.08	0.08	0.08	0.06	0.08	0.06	0.12	0.11	0.10	0.09	0.09	0.10
Al	1.89	1.85	2.08	2.13	1.98	1.89	2.02	2.08	2.11	2.03	1.91	2.11	2.17
Fe^{2+}	1.11	1.12	1.08	1.09	1.08	1.17	1.07	1.18	1.14	1.14	1.05	1.14	1.15
Mn	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.00
Mg	3.07	3.09	3.00	2.98	3.03	3.05	3.04	2.96	2.98	3.04	3.13	3.00	2.95
Ca	1.79	1.80	1.79	1.81	1.81	1.83	1.82	1.83	1.83	1.82	1.85	1.85	1.82
Na	0.57	0.58	0.62	0.64	0.57	0.58	0.61	0.63	0.66	0.64	0.56	0.65	0.66
K	0.05	0.04	0.04	0.05	0.04	0.04	0.04	0.05	0.04	0.05	0.05	0.05	0.04
Cr	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
Fe^{3+}	0.27	0.28	0.37	0.36	0.35	0.25	0.35	0.27	0.32	0.27	0.29	0.27	0.29
Zn	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.50	15.51	15.56	15.58	15.50	15.53	15.55	15.59	15.61	15.60	15.53	15.61	15.60

Mineral						Amphibole							
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 2.1	Hbl 2.2	Hbl 2.3	Hbl 2.4	Hbl 2.5	Hbl 2.6	Hbl 2.7	Hbl 2.8	Hbl 2.9	Hbl 2.10	Hbl 2,11	Hbl 2,12	Hbl 2,13
SiO_2	46.54	43.92	42.25	42.22	41.64	41.75	38.43	40.66	42.97	47.11	45.41	44.77	41.57
TiO_2	0.42	0.52	0.76	1.09	1.28	1.32	0.09	0.33	0.75	0.33	0.51	0.54	1.05
Al_2O_3	10.30	12.10	14.38	16.58	17.31	17.10	20.34	18.42	14.63	9.96	11.76	12.57	17.51
Fe*	12.99	14.02	14.32	13.15	13.46	13.17	17.00	13.52	12.64	13.34	13.74	13.52	13.11
MnO	0.06	0.07	0.06	0.07	0.06	0.05	0.06	0.08	0.05	0.06	0.07	0.06	0.04
MgO	14.37	12.82	11.93	11.33	10.86	10.88	7.72	10.96	12.74	14.07	13.22	13.09	11.38
CaO	11.41	10.98	11.55	10.81	10.88	11.10	11.13	11.09	11.52	11.46	11.29	11.41	11.13
Na_2O	1.92	2.06	2.44	2.76	2.89	2.79	3.08	2.71	2.59	1.78	2.14	2.15	2.71
K_2O	0.17	0.23	0.28	0.33	0.35	0.29	0.28	0.32	0.28	0.18	0.18	0.17	0.37
Cr_2O_3	*n.d.*	0.04	0.11	*n.d.*	0.02	0.04	0.02	0.06	0.04	*n.d.*	*n.d.*	0.05	0.02
ZnO	0.01	0.01	*n.d.*	*n.d.*	0.01	0.03	*n.d.*	0.03	0.04	*n.d.*	0.01	0.02	0.05
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.19	96.78	98.08	98.34	98.75	98.52	98.15	98.18	98.26	98.29	98.34	98.35	98.94
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.68	6.44	6.17	6.11	6.02	6.05	5.70	5.91	6.22	6.77	6.55	6.46	5.99
Ti	0.05	0.06	0.08	0.12	0.14	0.14	0.01	0.04	0.08	0.04	0.06	0.06	0.11
Al	1.74	2.09	2.47	2.83	2.95	2.92	3.56	3.15	2.50	1.69	2.00	2.14	2.97
Fe^{2+}	1.06	1.15	1.27	1.26	1.33	1.35	1.78	1.22	1.20	1.17	1.23	1.18	1.23
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	3.08	2.80	2.60	2.44	2.34	2.35	1.71	2.37	2.75	3.01	2.84	2.81	2.44
Ca	1.76	1.73	1.81	1.68	1.69	1.72	1.77	1.73	1.79	1.76	1.75	1.76	1.72
Na	0.53	0.59	0.69	0.77	0.81	0.78	0.89	0.76	0.73	0.50	0.60	0.60	0.76
K	0.03	0.04	0.05	0.06	0.06	0.05	0.05	0.06	0.05	0.03	0.03	0.03	0.07
Cr	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.00
Fe^{3+}	0.50	0.57	0.47	0.33	0.30	0.25	0.33	0.43	0.33	0.43	0.42	0.45	0.35
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.44	15.48	15.64	15.61	15.65	15.64	15.81	15.68	15.67	15.40	15.50	15.51	15.65

Mineral							Amphibole						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 2,14	Hbl 2,15	Hbl 2,16	Hbl 2,17	Hbl 2,18	Hbl 2,19	Hbl 2,20	Hbl 2,21	Hbl 3,1	Hbl 3,2	Hbl 3,3	Hbl 3,4	Hbl 3,5
SiO_2	41.75	41.18	39.69	41.24	42.05	42.26	44.59	46.83	43.30	44.34	44.91	45.69	44.19
TiO_2	1.54	1.14	1.30	1.64	1.65	1.58	1.57	1.16	0.36	0.32	0.42	0.37	0.56
Al_2O_3	17.03	17.79	18.86	16.35	15.40	14.33	12.32	9.78	14.56	13.65	12.85	11.58	13.42
Fe*	12.90	12.88	12.94	13.24	13.13	13.50	12.94	12.48	13.17	13.60	13.28	12.76	13.50
MnO	0.04	0.05	0.05	0.08	0.06	0.08	0.06	0.06	0.09	0.08	0.07	0.09	0.09
MgO	11.42	11.13	11.08	11.58	11.88	12.19	13.05	14.19	12.60	12.93	13.38	13.83	13.02
CaO	11.31	11.32	11.48	11.31	11.40	11.51	11.56	11.81	11.26	11.05	11.16	11.24	11.23
Na_2O	2.89	2.73	2.80	2.84	2.75	2.65	2.28	1.78	2.49	2.42	2.32	2.16	2.36
K_2O	0.29	0.32	0.36	0.37	0.34	0.29	0.21	0.17	0.31	0.26	0.22	0.22	0.21
Cr_2O_3	0.02	0.05	0.04	0.06	0.08	0.04	0.13	0.02	0.09	0.08	0.05	0.02	0.05
ZnO	0.03	0.04	*n.d.*	0.02	*n.d.*	0.01	0.01	0.02	*n.d.*	0.01	0.03	0.01	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.22	98.63	98.60	98.73	98.74	98.45	98.73	98.30	98.24	98.73	98.69	97.97	98.65
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.01	5.96	5.76	5.99	6.10	6.15	6.43	6.74	6.26	6.37	6.44	6.59	6.36
Ti	0.17	0.12	0.14	0.18	0.18	0.17	0.17	0.13	0.04	0.03	0.04	0.04	0.06
Al	2.89	3.03	3.22	2.80	2.63	2.46	2.09	1.66	2.48	2.31	2.17	1.97	2.28
Fe^{2+}	1.30	1.27	1.22	1.31	1.33	1.34	1.29	1.23	1.18	1.17	1.13	1.13	1.15
Mn	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.45	2.40	2.40	2.51	2.57	2.65	2.81	3.04	2.72	2.77	2.86	2.97	2.79
Ca	1.74	1.75	1.78	1.76	1.77	1.80	1.79	1.82	1.75	1.70	1.72	1.74	1.73
Na	0.81	0.77	0.79	0.80	0.77	0.75	0.64	0.50	0.70	0.67	0.65	0.60	0.66
K	0.05	0.06	0.07	0.07	0.06	0.05	0.04	0.03	0.06	0.05	0.04	0.04	0.04
Cr	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.01
Fe^{3+}	0.25	0.29	0.35	0.30	0.27	0.30	0.27	0.27	0.41	0.46	0.46	0.41	0.47
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.68	15.67	15.74	15.72	15.69	15.69	15.55	15.43	15.62	15.56	15.54	15.50	15.55

Mineral							Amphibole						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 4,1	Hbl 4,2	Hbl 4,3	Hbl 4,4	Hbl 4.5	Hbl 4.6	Hbl 4.7	Hbl 4.8	Hbl 4.9	Hbl 4.10	Hbl 4.11	Hbl 4.12	Hbl 4.13
SiO_2	48.79	43.71	41.65	41.77	41.77	44.13	41.56	42.44	42.85	43.35	44.94	46.25	47.42
TiO_2	0.36	0.51	0.61	0.38	0.34	0.41	0.80	0.36	0.60	0.61	0.41	0.34	0.28
Al_2O_3	8.33	14.08	16.62	16.78	15.65	13.03	15.79	15.09	14.36	13.60	11.94	10.33	8.97
Fe*	11.96	13.04	13.35	14.16	14.11	13.51	14.54	15.31	14.19	14.41	13.90	13.53	13.16
MnO	0.07	0.07	0.05	0.07	0.07	0.07	0.05	0.06	0.08	0.07	0.09	0.07	0.08
MgO	15.41	12.97	11.96	11.57	11.75	13.10	11.28	11.20	12.19	12.02	13.11	13.85	14.48
CaO	11.44	11.24	11.34	11.25	11.25	11.41	11.37	11.37	11.42	11.37	11.32	11.27	11.45
Na_2O	1.70	2.48	2.84	2.61	2.68	2.23	2.69	2.34	2.46	2.36	2.19	1.97	1.64
K_2O	0.16	0.27	0.31	0.28	0.32	0.23	0.32	0.27	0.27	0.27	0.21	0.18	0.18
Cr_2O_3	*n.d.*	0.02	0.08	0.07	0.08	0.08	0.05	0.06	0.07	0.04	0.06	0.04	0.02
ZnO	0.04	0.03	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	0.03	0.03	0.02	0.05	0.01	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.27	98.42	98.82	98.93	98.02	98.25	98.46	98.53	98.51	98.11	98.22	97.84	97.69
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.96	6.30	6.02	6.02	6.09	6.37	6.06	6.17	6.21	6.32	6.50	6.69	6.84
Ti	0.04	0.06	0.07	0.04	0.04	0.04	0.09	0.04	0.07	0.07	0.04	0.04	0.03
Al	1.40	2.39	2.83	2.85	2.69	2.22	2.71	2.59	2.45	2.34	2.04	1.76	1.52
Fe^{2+}	1.05	1.14	1.21	1.19	1.24	1.11	1.38	1.35	1.24	1.35	1.21	1.16	1.10
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	3.28	2.79	2.58	2.49	2.55	2.82	2.45	2.43	2.63	2.61	2.83	2.99	3.11
Ca	1.75	1.74	1.75	1.74	1.76	1.77	1.78	1.77	1.77	1.78	1.75	1.75	1.77
Na	0.47	0.69	0.80	0.73	0.76	0.62	0.76	0.66	0.69	0.67	0.61	0.55	0.46
K	0.03	0.05	0.06	0.05	0.06	0.04	0.06	0.05	0.05	0.05	0.04	0.03	0.03
Cr	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00
Fe^{3+}	0.37	0.43	0.41	0.51	0.48	0.52	0.40	0.52	0.48	0.41	0.47	0.47	0.49
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.36	15.60	15.72	15.64	15.69	15.54	15.70	15.59	15.62	15.60	15.52	15.45	15.37

Mineral							Amphibole						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 4.14	Hbl 5.1	Hbl 5.2	Hbl 5.3	Hbl 5.4	Hbl 5.5	Hbl 5.6	Hbl 5.7	Hbl 5.8	Hbl 5.9	Hbl 5.10	Hbl 5.11	Hbl 5.12
SiO_2	49.32	46.10	46.47	46.33	44.91	45.57	46.60	47.85	46.92	45.99	45.56	45.33	44.62
TiO_2	0.10	0.62	0.66	0.60	0.90	0.93	0.80	0.63	0.82	1.04	1.15	1.13	1.29
Al_2O_3	6.93	10.64	10.60	10.38	11.84	10.93	9.84	8.85	9.80	9.96	10.23	10.57	10.87
Fe*	12.02	11.06	11.01	11.10	11.66	11.41	10.96	10.57	10.70	10.96	11.32	11.46	11.71
MnO	0.06	0.03	0.06	0.05	0.02	0.03	0.06	0.04	0.05	0.05	0.02	0.03	0.05
MgO	15.52	14.77	15.11	15.10	14.17	14.19	15.22	15.77	15.23	14.75	14.58	14.17	14.13
CaO	11.69	11.53	11.60	11.68	11.75	11.65	11.58	11.64	11.81	12.07	11.96	11.94	11.80
Na_2O	1.29	1.99	1.99	1.95	2.14	2.10	1.93	1.75	1.81	1.91	1.93	2.03	2.12
K_2O	0.13	0.25	0.27	0.18	0.22	0.29	0.19	0.15	0.17	0.22	0.20	0.23	0.21
Cr_2O_3	0.05	0.15	*n.d.*	0.08	0.06	0.05	0.13	0.01	0.10	0.03	0.02	0.05	0.06
ZnO	0.02	0.03	0.01	0.02	0.05	0.01	0.03	0.03	0.01	0.02	0.02	0.02	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.14	97.15	97.77	97.48	97.71	97.16	97.34	97.29	97.41	97.00	96.99	96.97	96.86
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	7.11	6.67	6.67	6.67	6.49	6.63	6.72	6.87	6.76	6.69	6.63	6.62	6.53
Ti	0.01	0.07	0.07	0.06	0.10	0.10	0.09	0.07	0.09	0.11	0.13	0.12	0.14
Al	1.18	1.81	1.79	1.76	2.02	1.87	1.67	1.50	1.66	1.71	1.76	1.82	1.87
Fe^{2+}	1.04	1.02	0.98	0.95	1.06	1.15	0.97	0.95	1.00	1.10	1.09	1.19	1.13
Mn	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01
Mg	3.33	3.19	3.23	3.24	3.05	3.08	3.27	3.38	3.27	3.20	3.16	3.09	3.08
Ca	1.80	1.79	1.78	1.80	1.82	1.82	1.79	1.79	1.82	1.88	1.87	1.87	1.85
Na	0.36	0.56	0.55	0.54	0.60	0.59	0.54	0.49	0.51	0.54	0.54	0.57	0.60
K	0.02	0.05	0.05	0.03	0.04	0.05	0.03	0.03	0.03	0.04	0.04	0.04	0.04
Cr	0.01	0.02	0.00	0.01	0.01	0.01	0.02	0.00	0.01	0.00	0.00	0.01	0.01
Fe^{3+}	0.41	0.32	0.35	0.39	0.35	0.24	0.35	0.32	0.29	0.23	0.29	0.21	0.30
Zn	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.28	15.49	15.49	15.47	15.54	15.54	15.46	15.40	15.44	15.52	15.51	15.55	15.56

Mineral							Amphibole						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 5.14	Hbl 5.15	Hbl 5.16	Hbl 5.17	Hbl 5.18	Hbl 5.19	Hbl 5.20	Hbl 5.21	Hbl 5.22	Hbl 5.23	Hbl 5.24	Hbl 5.25	Hbl 5.26
SiO_2	44.91	44.74	46.30	44.65	44.39	45.50	44.35	45.02	44.26	44.14	43.81	41.75	41.82
TiO_2	0.97	0.94	0.79	1.08	1.03	1.05	1.21	0.93	0.74	0.49	0.58	0.65	0.47
Al_2O_3	10.82	10.74	9.24	11.14	11.39	10.10	10.91	10.49	11.02	11.01	11.09	13.55	15.01
Fe*	11.83	11.62	11.11	12.02	11.76	11.60	12.43	12.57	12.11	11.77	12.36	13.09	13.17
MnO	0.03	0.03	0.05	0.06	0.06	0.03	0.05	0.05	0.06	0.03	0.04	0.05	0.04
MgO	14.11	14.31	15.19	13.93	13.84	14.50	13.76	13.83	14.19	14.32	14.12	13.00	12.52
CaO	11.56	11.65	11.73	11.71	11.71	11.86	11.65	11.65	11.50	11.65	11.69	11.46	11.41
Na_2O	2.14	2.03	1.68	2.16	2.16	1.88	2.07	2.06	2.15	2.06	2.08	2.33	2.54
K_2O	0.20	0.22	0.21	0.21	0.24	0.22	0.21	0.21	0.22	0.23	0.18	0.30	0.34
Cr_2O_3	*n.d.*	0.03	0.09	0.07	0.07	0.04	0.05	0.01	0.02	0.03	*n.d.*	0.04	0.03
ZnO	0.03	0.01	0.04	*n.d.*	0.01	0.05	*n.d.*	0.04	0.05	0.03	*n.d.*	0.02	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	96.61	96.32	96.43	97.03	96.65	96.83	96.70	96.86	96.31	95.76	95.95	96.23	97.37
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.58	6.56	6.74	6.52	6.51	6.64	6.51	6.59	6.50	6.50	6.45	6.17	6.11
Ti	0.11	0.10	0.09	0.12	0.11	0.12	0.13	0.10	0.08	0.05	0.06	0.07	0.05
Al	1.87	1.86	1.59	1.92	1.97	1.74	1.89	1.81	1.91	1.91	1.93	2.36	2.59
Fe^{2+}	1.13	1.05	0.93	1.15	1.15	1.07	1.15	1.19	1.00	0.94	0.95	0.98	1.08
Mn	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.00
Mg	3.08	3.13	3.30	3.03	3.03	3.15	3.01	3.02	3.10	3.15	3.10	2.86	2.73
Ca	1.81	1.83	1.83	1.83	1.84	1.85	1.83	1.83	1.81	1.84	1.85	1.81	1.79
Na	0.61	0.58	0.47	0.61	0.61	0.53	0.59	0.59	0.61	0.59	0.59	0.67	0.72
K	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.06	0.06
Cr	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.32	0.38	0.42	0.32	0.29	0.34	0.37	0.35	0.49	0.51	0.58	0.64	0.53
Zn	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.55	15.53	15.42	15.56	15.57	15.49	15.54	15.53	15.55	15.55	15.55	15.62	15.67

Mineral							Amphibole						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 6.1	Hbl 6.2	Hbl 6.3	Hbl 6.4	Hbl 6.5	Hbl 6.6	Hbl 6.7	Hbl 7.1	Hbl 7.2	Hbl 7.3	Hbl 7.4	Hbl 7.5	Hbl 8.1
SiO_2	46.39	47.68	47.50	48.41	48.36	46.39	44.60	47.48	45.17	45.23	44.96	45.05	43.34
TiO_2	0.75	0.48	0.37	0.18	0.30	0.32	0.81	0.48	0.44	0.39	0.49	0.67	0.39
Al_2O_3	10.67	9.93	9.94	9.00	9.08	10.76	11.51	9.36	11.77	11.74	11.52	11.35	12.32
Fe*	10.27	9.99	9.91	9.49	9.93	10.20	10.63	10.84	11.66	11.11	11.44	11.31	17.12
MnO	0.04	0.04	0.04	0.03	0.05	0.03	0.05	0.03	0.06	0.04	0.06	0.06	0.09
MgO	15.37	16.10	16.24	16.72	16.63	15.71	14.93	15.51	14.77	14.77	14.69	14.59	11.42
CaO	12.03	11.40	11.32	11.52	11.34	11.33	11.58	11.89	11.44	11.60	11.54	11.88	10.97
Na_2O	1.88	1.89	1.93	1.74	1.81	1.96	2.12	1.72	2.17	2.12	2.19	2.10	2.36
K_2O	0.21	0.25	0.20	0.16	0.19	0.20	0.24	0.14	0.36	0.23	0.19	0.18	0.20
Cr_2O_3	0.11	0.04	0.06	0.03	0.01	0.03	0.08	0.12	0.05	0.05	0.09	0.12	*n.d.*
ZnO	0.03	0.03	*n.d.*	0.05	0.04	0.03	*n.d.*	*n.d.*	0.02	0.03	*n.d.*	0.03	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.74	97.83	97.50	97.32	97.75	96.96	96.55	97.57	97.90	97.31	97.18	97.33	98.23
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.65	6.78	6.77	6.89	6.87	6.66	6.49	6.81	6.49	6.53	6.51	6.52	6.35
Ti	0.08	0.05	0.04	0.02	0.03	0.03	0.09	0.05	0.05	0.04	0.05	0.07	0.04
Al	1.80	1.67	1.67	1.51	1.52	1.82	1.97	1.58	1.99	2.00	1.97	1.94	2.13
Fe^{2+}	0.91	0.81	0.76	0.72	0.74	0.76	0.86	0.94	0.89	0.90	0.91	0.97	1.43
Mn	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01
Mg	3.28	3.42	3.45	3.55	3.52	3.36	3.24	3.32	3.16	3.18	3.17	3.15	2.49
Ca	1.85	1.74	1.73	1.76	1.73	1.74	1.80	1.83	1.76	1.79	1.79	1.84	1.72
Na	0.52	0.52	0.53	0.48	0.50	0.55	0.60	0.48	0.60	0.59	0.61	0.59	0.67
K	0.04	0.04	0.04	0.03	0.03	0.04	0.04	0.03	0.07	0.04	0.03	0.03	0.04
Cr	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Fe^{3+}	0.32	0.38	0.42	0.41	0.44	0.47	0.44	0.36	0.51	0.44	0.48	0.40	0.67
Zn	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.48	15.42	15.43	15.38	15.39	15.45	15.54	15.41	15.54	15.53	15.54	15.54	15.56

Mineral							Amphibole						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 8.2	Hbl 8.3	Hbl 8.4	Hbl 8.5	Hbl 8.6	Hbl 8.7	Hbl 8.8	Hbl 8.9	Hbl 8.10	Hbl 8.11	Hbl 8.12	Hbl 8.13	Hbl 8.14
SiO_2	45.35	45.18	44.32	42.58	42.38	42.78	42.43	35.29	39.87	39.59	39.60	36.51	36.80
TiO_2	0.26	0.24	0.21	0.35	0.41	0.15	0.26	0.09	1.23	1.01	1.12	0.08	0.09
Al_2O_3	10.28	10.27	11.21	12.73	13.26	13.02	13.22	20.80	16.03	15.89	16.10	17.24	17.90
Fe*	16.42	16.17	16.89	17.27	16.95	15.05	14.98	20.04	14.88	15.34	15.04	20.13	19.74
MnO	0.09	0.08	0.09	0.06	0.06	0.07	0.09	0.17	0.07	0.06	0.05	0.09	0.11
MgO	12.57	12.42	11.90	11.13	10.97	12.17	12.00	6.15	10.65	10.66	10.46	7.15	7.52
CaO	10.98	11.08	10.77	11.12	11.28	11.39	11.46	10.78	11.40	11.21	11.56	11.15	11.30
Na_2O	1.95	1.88	2.15	2.27	2.20	2.26	2.31	3.16	2.37	2.65	2.53	2.85	2.92
K_2O	0.19	0.16	0.22	0.22	0.25	0.23	0.23	0.18	0.26	0.27	0.22	0.29	0.28
Cr_2O_3	0.03	0.03	*n.d.*	0.04	0.08	0.02	0.06	0.02	0.09	0.05	0.08	0.02	0.07
ZnO	*n.d.*	0.01	0.06	0.04	0.02	0.02	0.02	0.01	*n.d.*	0.01	0.02	0.01	0.07
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.12	97.52	97.81	97.81	97.86	97.16	97.05	96.69	96.85	96.74	96.78	95.52	96.79
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.60	6.62	6.50	6.27	6.24	6.29	6.26	5.38	5.92	5.90	5.90	5.65	5.60
Ti	0.03	0.03	0.02	0.04	0.05	0.02	0.03	0.01	0.14	0.11	0.13	0.01	0.01
Al	1.76	1.77	1.94	2.21	2.30	2.26	2.30	3.74	2.81	2.79	2.83	3.14	3.21
Fe^{2+}	1.31	1.33	1.37	1.40	1.41	1.19	1.23	1.80	1.31	1.33	1.38	1.82	1.71
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Mg	2.73	2.71	2.60	2.44	2.41	2.67	2.64	1.40	2.36	2.37	2.32	1.65	1.71
Ca	1.71	1.74	1.69	1.76	1.78	1.79	1.81	1.76	1.81	1.79	1.85	1.85	1.84
Na	0.55	0.53	0.61	0.65	0.63	0.64	0.66	0.93	0.68	0.77	0.73	0.85	0.86
K	0.04	0.03	0.04	0.04	0.05	0.04	0.04	0.03	0.05	0.05	0.04	0.06	0.05
Cr	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.01
Fe^{3+}	0.69	0.65	0.70	0.73	0.68	0.66	0.62	0.76	0.54	0.58	0.50	0.79	0.81
Zn	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.43	15.42	15.49	15.56	15.56	15.58	15.60	15.84	15.63	15.71	15.69	15.83	15.83

Mineral							Amphibole						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 8.15	Hbl 8.16	Hbl 8.17	Hbl 8.18	Hbl 8.19	Hbl 8.20	Hbl 8.21	Hbl 8.22	Hbl 8.23	Hbl 8.24	Hbl 8.25	Hbl 8.26	Hbl 8.27
SiO_2	39.55	39.77	39.87	41.59	41.57	41.12	37.34	36.11	41.41	41.57	38.95	42.11	43.88
TiO_2	0.41	0.35	0.52	0.82	0.86	0.96	0.19	0.22	0.77	0.77	0.72	0.45	0.38
Al_2O_3	19.00	18.47	18.45	14.90	14.32	14.49	19.67	21.42	14.16	13.99	18.36	13.47	11.64
Fe*	15.57	15.22	15.15	14.00	14.18	14.15	16.61	18.44	15.32	15.42	13.27	13.28	12.56
MnO	0.09	0.08	0.04	0.06	0.07	0.05	0.06	0.14	0.09	0.06	0.10	0.07	0.05
MgO	9.64	10.03	10.13	11.74	11.78	11.81	8.38	6.95	11.16	11.23	11.13	12.97	13.65
CaO	11.19	11.36	11.30	11.18	11.34	11.36	11.31	11.09	11.43	11.21	11.38	11.51	11.71
Na_2O	2.75	2.75	2.73	2.41	2.30	2.43	2.88	2.74	2.44	2.36	2.80	2.45	2.06
K_2O	0.23	0.21	0.23	0.32	0.21	0.22	0.24	0.23	0.23	0.22	0.30	0.19	0.16
Cr_2O_3	0.02	0.02	0.04	0.06	0.02	0.02	0.09	0.02	0.04	0.12	0.06	0.05	*n.d.*
ZnO	0.01	0.02	*n.d.*	0.03	0.01	0.03	0.03	0.01	0.02	*n.d.*	0.01	0.02	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.47	98.28	98.46	97.11	96.65	96.65	96.80	97.37	97.06	96.94	97.08	96.57	96.09
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	5.78	5.82	5.82	6.12	6.14	6.09	5.60	5.41	6.14	6.16	5.73	6.20	6.46
Ti	0.05	0.04	0.06	0.09	0.10	0.11	0.02	0.02	0.09	0.09	0.08	0.05	0.04
Al	3.27	3.18	3.17	2.58	2.49	2.53	3.48	3.78	2.47	2.44	3.19	2.34	2.02
Fe^{2+}	1.39	1.34	1.34	1.23	1.21	1.20	1.51	1.57	1.38	1.35	1.09	1.02	1.03
Mn	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Mg	2.10	2.19	2.20	2.58	2.60	2.61	1.87	1.55	2.47	2.48	2.44	2.85	3.00
Ca	1.75	1.78	1.77	1.76	1.80	1.80	1.82	1.78	1.82	1.78	1.79	1.82	1.85
Na	0.78	0.78	0.77	0.69	0.66	0.70	0.84	0.80	0.70	0.68	0.80	0.70	0.59
K	0.04	0.04	0.04	0.06	0.04	0.04	0.05	0.04	0.04	0.04	0.06	0.04	0.03
Cr	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.00
Fe^{3+}	0.51	0.52	0.50	0.49	0.54	0.55	0.57	0.74	0.52	0.56	0.54	0.62	0.52
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.69	15.70	15.69	15.62	15.59	15.63	15.79	15.72	15.65	15.60	15.75	15.64	15.54

Mineral							Amphibole						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Hbl 9.1	Hbl 9.2	Hbl 9.3	Hbl 9.4	Hbl 9.5	Hbl 9.6	Hbl 9.7	Hbl 9.8	Hbl 9.9	Hbl 10.1	Hbl 10.2	Hbl 10.3	Hbl 10.4
SiO_2	41.35	40.63	40.56	42.64	41.41	41.66	41.21	43.11	46.40	44.95	45.67	44.93	43.66
TiO_2	0.53	0.30	1.33	0.17	0.30	0.35	0.84	1.33	0.51	0.43	0.30	0.46	0.76
Al_2O_3	14.52	15.68	14.50	11.59	13.05	15.43	14.62	11.88	8.09	11.26	10.50	11.00	11.83
Fe*	15.04	15.03	13.94	15.89	15.33	15.33	14.01	13.49	12.19	13.00	13.03	11.76	12.28
MnO	0.09	0.08	0.08	0.12	0.10	0.08	0.03	0.06	0.04	0.04	0.05	0.05	0.07
MgO	11.55	11.27	11.78	11.99	12.15	11.13	11.71	13.00	14.70	13.88	14.33	14.58	13.65
CaO	11.19	11.22	10.76	10.72	10.68	11.12	11.45	11.63	11.97	11.51	11.52	11.69	11.62
Na_2O	2.48	2.57	2.51	2.42	2.30	2.59	2.49	2.24	1.49	2.05	1.94	2.06	2.21
K_2O	0.25	0.29	0.25	0.23	0.26	0.25	0.30	0.19	0.16	0.20	0.14	0.13	0.17
Cr_2O_3	0.03	0.04	0.01	0.05	*n.d.*	0.02	0.11	0.11	0.07	0.04	0.02	0.09	0.12
ZnO	0.04	*n.d.*	0.02	0.02	0.03	0.05	0.03	0.05	0.03	*n.d.*	0.03	0.03	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.08	97.12	95.73	95.84	95.61	98.00	96.80	97.09	95.66	97.36	97.54	96.78	96.39
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.10	6.00	6.06	6.38	6.18	6.10	6.10	6.34	6.84	6.53	6.60	6.54	6.42
Ti	0.06	0.03	0.15	0.02	0.03	0.04	0.09	0.15	0.06	0.05	0.03	0.05	0.08
Al	2.53	2.73	2.55	2.04	2.29	2.66	2.55	2.06	1.41	1.93	1.79	1.89	2.05
Fe^{2+}	1.23	1.20	1.18	1.29	1.03	1.32	1.27	1.20	1.05	1.05	0.98	0.91	1.06
Mn	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.54	2.48	2.62	2.67	2.70	2.43	2.58	2.85	3.23	3.01	3.09	3.16	2.99
Ca	1.77	1.77	1.72	1.72	1.71	1.74	1.82	1.83	1.89	1.79	1.78	1.82	1.83
Na	0.71	0.74	0.73	0.70	0.67	0.73	0.71	0.64	0.43	0.58	0.54	0.58	0.63
K	0.05	0.06	0.05	0.04	0.05	0.05	0.06	0.04	0.03	0.04	0.03	0.02	0.03
Cr	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01
Fe^{3+}	0.63	0.66	0.56	0.70	0.88	0.55	0.47	0.46	0.46	0.52	0.60	0.52	0.45
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.63	15.67	15.63	15.60	15.56	15.65	15.67	15.59	15.40	15.50	15.46	15.51	15.57

Mineral							Amphibole						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03B
Anl code	Hbl 10.5	Hbl 10.6	Hbl 10.7	Hbl 10.8	Hbl 10.9	Hbl 10.10	Hbl 10.11	Hbl 11.1	Hbl 11.2	Hbl 11.3	Hbl 11.4	Hbl 11.5	Hbl 1.1
SiO_2	45.29	46.97	44.86	45.64	44.75	44.65	45.79	42.20	42.30	40.28	41.02	41.49	43.99
TiO_2	1.06	0.64	0.80	0.89	0.78	0.59	0.68	0.52	0.55	0.50	0.30	0.59	0.83
Al_2O_3	10.09	8.29	10.50	9.22	10.20	10.57	9.24	14.54	14.34	16.95	16.85	15.35	12.49
Fe*	11.02	10.47	11.43	11.03	11.35	11.75	11.11	11.85	12.00	12.50	12.87	12.83	13.23
MnO	0.04	0.06	0.06	0.05	0.08	0.05	0.06	0.05	0.06	0.06	0.08	0.06	0.10
MgO	14.72	15.77	14.60	15.08	14.85	14.47	15.45	13.55	13.50	12.38	12.43	12.71	13.05
CaO	11.72	11.81	11.65	11.85	11.86	11.65	11.89	11.35	11.16	11.27	11.12	11.30	11.18
Na_2O	1.91	1.62	2.02	1.81	2.02	2.01	1.70	2.62	2.50	2.73	2.74	2.47	2.33
K_2O	0.20	0.15	0.25	0.19	0.21	0.25	0.16	0.26	0.28	0.30	0.29	0.24	0.19
Cr_2O_3	0.12	0.06	0.08	0.05	0.08	0.06	0.09	*n.d.*	0.06	0.06	0.06	0.05	0.04
ZnO	0.04	0.02	*n.d.*	0.02	0.01	0.07	0.04	0.02	0.01	*n.d.*	0.01	0.01	0.05
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	96.20	95.87	96.26	95.83	96.19	96.12	96.21	96.97	96.75	97.04	97.76	97.09	97.47
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.63	6.85	6.57	6.70	6.56	6.55	6.67	6.15	6.17	5.89	5.95	6.06	6.41
Ti	0.12	0.07	0.09	0.10	0.09	0.06	0.07	0.06	0.06	0.06	0.03	0.07	0.09
Al	1.74	1.43	1.81	1.60	1.76	1.83	1.59	2.50	2.47	2.92	2.88	2.64	2.15
Fe^{2+}	1.01	0.88	0.98	0.96	0.92	0.96	0.80	0.91	0.90	0.93	0.95	0.95	1.19
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	3.21	3.43	3.19	3.30	3.24	3.17	3.36	2.94	2.94	2.70	2.69	2.77	2.84
Ca	1.84	1.85	1.83	1.86	1.86	1.83	1.86	1.77	1.75	1.77	1.73	1.77	1.75
Na	0.54	0.46	0.57	0.52	0.57	0.57	0.48	0.74	0.71	0.77	0.77	0.70	0.66
K	0.04	0.03	0.05	0.04	0.04	0.05	0.03	0.05	0.05	0.06	0.05	0.04	0.03
Cr	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Fe^{3+}	0.34	0.40	0.42	0.39	0.47	0.49	0.55	0.53	0.57	0.60	0.61	0.61	0.42
Zn	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.49	15.40	15.53	15.48	15.54	15.53	15.43	15.67	15.62	15.71	15.68	15.62	15.56

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 1.2	Hbl 1.3	Hbl 1.4	Hbl 1.5	Hbl 1.6	Hbl 1.7	Hbl 2.1	Hbl 2.2	Hbl 2.3	Hbl 2.4	Hbl 2.5	Hbl 2.6	Hbl 2.7
SiO_2	44.28	44.18	43.71	43.68	44.61	45.25	43.63	43.34	43.80	43.73	43.45	43.40	43.63
TiO_2	0.65	0.76	0.69	0.80	0.82	0.90	0.93	1.66	1.45	0.74	0.85	0.92	1.14
Al_2O_3	12.41	12.65	13.02	13.02	12.31	11.81	12.56	12.76	12.04	12.83	13.25	13.14	12.41
Fe*	12.90	13.02	13.13	12.87	13.03	12.32	14.32	14.53	14.18	14.28	13.98	14.19	14.19
MnO	0.08	0.10	0.10	0.09	0.11	0.07	0.08	0.07	0.08	0.08	0.10	0.09	0.10
MgO	13.29	13.29	12.66	12.91	13.05	13.34	12.17	11.97	12.34	12.40	12.21	12.25	12.15
CaO	11.27	11.33	11.24	11.26	11.43	11.54	11.29	11.39	11.32	10.82	11.02	11.05	11.09
Na_2O	2.37	2.45	2.40	2.51	2.35	2.12	2.45	2.55	2.35	2.50	2.45	2.61	2.52
K_2O	0.22	0.23	0.27	0.22	0.22	0.17	0.24	0.22	0.22	0.27	0.20	0.26	0.29
Cr_2O_3	0.09	0.05	0.06	0.03	0.07	0.09	0.04	0.06	0.10	0.03	0.05	0.06	0.03
ZnO	0.03	0.02	*n.d.*	0.02	0.03	0.03	0.02	0.03	0.02	0.01	*n.d.*	0.01	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.59	98.08	97.27	97.41	98.04	97.65	97.73	98.59	97.90	97.69	97.56	97.98	97.57
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.44	6.40	6.40	6.38	6.47	6.56	6.40	6.32	6.41	6.39	6.35	6.34	6.41
Ti	0.07	0.08	0.08	0.09	0.09	0.10	0.10	0.18	0.16	0.08	0.09	0.10	0.13
Al	2.13	2.16	2.25	2.24	2.11	2.02	2.17	2.19	2.08	2.21	2.28	2.26	2.15
Fe^{2+}	1.18	1.19	1.27	1.23	1.27	1.23	1.42	1.48	1.42	1.30	1.32	1.35	1.42
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.88	2.87	2.76	2.81	2.82	2.88	2.66	2.60	2.69	2.70	2.66	2.67	2.66
Ca	1.76	1.76	1.76	1.76	1.78	1.79	1.77	1.78	1.78	1.69	1.73	1.73	1.74
Na	0.67	0.69	0.68	0.71	0.66	0.60	0.70	0.72	0.67	0.71	0.69	0.74	0.72
K	0.04	0.04	0.05	0.04	0.04	0.03	0.04	0.04	0.04	0.05	0.04	0.05	0.05
Cr	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00
Fe^{3+}	0.39	0.39	0.34	0.34	0.31	0.26	0.33	0.29	0.32	0.44	0.39	0.38	0.32
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.58	15.60	15.60	15.62	15.58	15.50	15.62	15.63	15.58	15.58	15.58	15.63	15.62

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 2.8	Hbl 2.9	Hbl 2.10	Hbl 2.11	Hbl 2.12	Hbl 2.13	Hbl 2.14	Hbl 2.15	Hbl 2.16	Hbl 2.17	Hbl 2.18	Hbl 3.1	Hbl 3.2
SiO_2	45.54	44.99	44.44	44.91	46.55	44.56	44.25	44.65	45.36	44.62	45.18	42.44	43.59
TiO_2	1.45	1.14	1.20	1.29	1.32	1.34	1.57	1.44	1.01	1.22	1.01	0.50	0.47
Al_2O_3	10.13	10.72	11.29	10.67	8.72	11.33	10.91	11.01	10.51	11.07	10.57	15.06	14.06
Fe*	14.21	14.27	14.70	14.68	13.89	14.65	14.98	14.10	14.36	14.66	14.37	14.06	13.50
MnO	0.08	0.09	0.09	0.08	0.08	0.10	0.09	0.08	0.08	0.10	0.09	0.07	0.09
MgO	12.85	12.76	12.25	12.51	13.04	12.36	11.88	12.35	12.68	12.36	12.58	12.06	12.94
CaO	11.56	11.17	11.24	11.25	11.66	11.09	11.08	11.39	11.47	10.91	11.61	10.77	10.56
Na_2O	2.07	2.26	2.32	2.21	1.73	2.43	2.44	2.19	2.02	2.24	2.09	2.70	2.53
K_2O	0.22	0.18	0.17	0.15	0.15	0.17	0.16	0.17	0.14	0.21	0.12	0.22	0.23
Cr_2O_3	0.05	0.08	0.08	0.05	0.08	0.04	0.06	0.03	0.08	0.07	0.05	0.08	0.03
ZnO	0.02	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	0.04	0.02	*n.d.*	*n.d.*	0.01	0.03	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.19	97.66	97.78	97.83	97.24	98.07	97.45	97.43	97.71	97.46	97.68	97.97	98.00
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.64	6.58	6.52	6.57	6.83	6.51	6.53	6.56	6.63	6.55	6.62	6.17	6.29
Ti	0.16	0.13	0.13	0.14	0.15	0.15	0.17	0.16	0.11	0.13	0.11	0.05	0.05
Al	1.74	1.85	1.95	1.84	1.51	1.95	1.90	1.91	1.81	1.91	1.83	2.58	2.39
Fe^{2+}	1.47	1.41	1.48	1.47	1.50	1.45	1.57	1.48	1.45	1.42	1.48	1.21	1.07
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.79	2.78	2.68	2.73	2.85	2.69	2.61	2.70	2.76	2.70	2.75	2.61	2.79
Ca	1.81	1.75	1.77	1.76	1.83	1.74	1.75	1.79	1.80	1.71	1.82	1.68	1.63
Na	0.59	0.64	0.66	0.63	0.49	0.69	0.70	0.62	0.57	0.64	0.59	0.76	0.71
K	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.02	0.04	0.04
Cr	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Fe^{3+}	0.26	0.34	0.32	0.33	0.20	0.34	0.28	0.25	0.31	0.38	0.28	0.50	0.56
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.51	15.53	15.56	15.52	15.42	15.56	15.57	15.53	15.49	15.51	15.52	15.63	15.55

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 3.3	Hbl 3.4	Hbl 3.5	Hbl 3.6	Hbl 3.7	Hbl 3.8	Hbl 3.9	Hbl 3.10	Hbl 4.1	Hbl 4.2	Hbl 4.3	Hbl 4.4	Hbl 4.5
SiO_2	43.80	43.05	41.92	42.63	41.18	42.95	42.12	42.24	44.06	45.22	43.85	44.88	43.99
TiO_2	0.42	0.41	0.44	0.67	0.44	0.42	0.81	0.66	1.36	1.26	1.23	1.18	1.02
Al_2O_3	13.86	14.52	15.57	14.35	16.60	15.38	15.33	15.02	11.46	10.98	12.30	11.13	12.38
Fe*	13.52	14.23	14.28	14.69	14.82	13.87	14.10	14.35	14.47	13.53	14.32	14.65	14.15
MnO	0.08	0.06	0.08	0.08	0.09	0.08	0.08	0.10	0.09	0.05	0.05	0.11	0.08
MgO	13.07	12.65	11.71	12.09	11.16	12.21	11.44	11.67	12.31	12.77	11.99	12.62	12.24
CaO	10.37	10.59	10.94	10.82	10.80	10.62	11.06	11.13	11.36	11.82	11.31	11.36	11.31
Na_2O	2.63	2.63	2.72	2.65	2.73	2.66	2.69	2.65	2.24	2.01	2.52	2.20	2.48
K_2O	0.22	0.17	0.27	0.20	0.18	0.21	0.23	0.23	0.14	0.17	0.18	0.16	0.21
Cr_2O_3	0.03	0.04	0.06	0.03	0.05	0.04	0.11	0.04	0.09	0.10	0.08	0.05	0.10
ZnO	0.03	0.02	*n.d.*	0.01	0.03	*n.d.*	0.05	0.02	*n.d.*	0.05	0.03	0.03	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.03	98.38	97.99	98.23	98.07	98.44	98.02	98.10	97.58	97.96	97.86	98.37	97.99
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.32	6.21	6.11	6.20	6.00	6.19	6.15	6.16	6.47	6.59	6.43	6.53	6.43
Ti	0.05	0.04	0.05	0.07	0.05	0.05	0.09	0.07	0.15	0.14	0.14	0.13	0.11
Al	2.36	2.47	2.68	2.46	2.85	2.61	2.64	2.58	1.98	1.89	2.13	1.91	2.13
Fe^{2+}	1.05	1.08	1.25	1.24	1.23	1.14	1.34	1.32	1.45	1.44	1.49	1.42	1.43
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.81	2.72	2.54	2.62	2.42	2.62	2.49	2.54	2.70	2.78	2.62	2.74	2.67
Ca	1.60	1.64	1.71	1.68	1.69	1.64	1.73	1.74	1.79	1.85	1.78	1.77	1.77
Na	0.74	0.74	0.77	0.75	0.77	0.74	0.76	0.75	0.64	0.57	0.72	0.62	0.70
K	0.04	0.03	0.05	0.04	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.04
Cr	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01
Fe^{3+}	0.58	0.64	0.49	0.55	0.58	0.53	0.38	0.43	0.33	0.21	0.27	0.36	0.30
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.55	15.57	15.66	15.62	15.64	15.58	15.65	15.65	15.55	15.51	15.61	15.53	15.61

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 4.7	Hbl 4.8	Hbl 4.9	Hbl 4.10	Hbl 4.11	Hbl 4.12	Hbl 4.13	Hbl 4.14	Hbl 4.15	Hbl 4.16	Hbl 4.17	Hbl 4.18	Hbl 4.19
SiO_2	44.30	44.93	51.46	43.88	44.41	44.49	44.18	44.22	44.52	44.23	44.32	44.68	44.41
TiO_2	1.44	1.23	0.36	0.97	1.03	0.76	0.76	0.74	0.86	0.98	1.18	1.31	0.93
Al_2O_3	11.64	11.36	4.73	12.36	11.48	11.29	12.24	11.99	11.83	12.27	11.48	11.65	12.08
Fe*	14.16	13.20	11.94	14.45	14.46	13.94	13.70	13.57	13.31	13.15	13.51	13.21	13.27
MnO	0.10	0.08	0.09	0.09	0.08	0.06	0.07	0.08	0.07	0.08	0.05	0.07	0.09
MgO	12.37	13.14	15.92	12.54	12.55	13.01	12.91	13.20	13.29	13.00	12.89	13.13	13.07
CaO	11.21	11.34	12.33	11.08	11.18	11.37	11.35	11.26	11.34	11.35	11.40	11.33	11.48
Na_2O	2.34	2.45	0.91	2.48	2.27	2.32	2.29	2.38	2.34	2.32	2.23	2.36	2.25
K_2O	0.24	0.14	0.08	0.19	0.13	0.14	0.19	0.20	0.18	0.22	0.15	0.20	0.27
Cr_2O_3	0.06	0.07	0.08	0.02	0.10	0.06	0.10	0.04	0.06	0.03	0.07	0.03	0.05
ZnO	*n.d.*	0.02	0.03	0.01	0.04	*n.d.*	0.01	0.03	*n.d.*	0.03	0.02	0.06	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.86	97.96	97.94	98.08	97.72	97.44	97.80	97.71	97.81	97.65	97.31	98.03	97.90
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.48	6.53	7.37	6.40	6.49	6.51	6.43	6.44	6.47	6.45	6.50	6.49	6.46
Ti	0.16	0.13	0.04	0.11	0.11	0.08	0.08	0.08	0.09	0.11	0.13	0.14	0.10
Al	2.01	1.95	0.80	2.12	1.98	1.95	2.10	2.06	2.03	2.11	1.98	1.99	2.07
Fe^{2+}	1.43	1.32	1.20	1.34	1.38	1.30	1.25	1.21	1.23	1.27	1.34	1.29	1.28
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.70	2.85	3.40	2.72	2.74	2.84	2.80	2.87	2.88	2.82	2.82	2.84	2.83
Ca	1.76	1.77	1.89	1.73	1.75	1.78	1.77	1.76	1.77	1.77	1.79	1.76	1.79
Na	0.66	0.69	0.25	0.70	0.64	0.66	0.65	0.67	0.66	0.66	0.63	0.66	0.63
K	0.05	0.03	0.02	0.04	0.02	0.03	0.04	0.04	0.03	0.04	0.03	0.04	0.05
Cr	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01
Fe^{3+}	0.30	0.28	0.23	0.42	0.39	0.40	0.42	0.44	0.39	0.34	0.32	0.31	0.34
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.56	15.57	15.21	15.59	15.54	15.57	15.56	15.58	15.57	15.57	15.55	15.56	15.57

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 5.1	Hbl 5.2	Hbl 5.3	Hbl 5.4	Hbl 5.5	Hbl 5.6	Hbl 5.7	Hbl 5.8	Hbl 5.9	Hbl 5.10	Hbl 5.11	Hbl 5.12	Hbl 5.13
SiO_2	44.72	44.36	43.87	42.01	44.59	42.39	43.57	45.35	44.83	42.77	42.46	43.73	46.36
TiO_2	1.24	1.30	1.23	1.50	1.37	1.02	0.96	0.63	1.24	1.26	1.01	0.94	0.53
Al_2O_3	11.42	11.83	12.53	14.62	11.72	14.32	13.07	11.14	11.56	14.14	14.70	12.41	9.54
Fe*	13.25	12.86	12.83	13.87	13.07	14.37	14.11	14.03	13.79	13.65	14.56	14.13	13.72
MnO	0.09	0.06	0.05	0.06	0.07	0.09	0.06	0.08	0.07	0.06	0.09	0.08	0.08
MgO	13.04	13.23	12.87	11.72	13.13	11.81	12.42	13.06	12.94	11.74	11.91	12.69	12.98
CaO	11.35	11.30	11.34	11.41	11.73	11.16	11.11	11.08	11.27	11.35	11.27	11.32	11.84
Na_2O	2.38	2.42	2.44	2.71	2.26	2.69	2.61	2.29	2.33	2.59	2.82	2.56	1.61
K_2O	0.16	0.17	0.14	0.24	0.21	0.18	0.21	0.18	0.15	0.19	0.28	0.23	0.15
Cr_2O_3	0.05	0.06	0.08	0.10	0.06	0.08	0.07	0.02	0.01	0.18	0.06	0.01	0.07
ZnO	0.01	0.03	*n.d.*	0.04	0.05	*n.d.*	0.02	0.04	0.04	0.03	*n.d.*	0.01	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.71	97.62	97.39	98.29	98.26	98.12	98.22	97.89	98.23	97.96	99.17	98.12	96.89
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.52	6.46	6.41	6.14	6.47	6.19	6.34	6.59	6.51	6.25	6.15	6.38	6.81
Ti	0.14	0.14	0.14	0.17	0.15	0.11	0.11	0.07	0.13	0.14	0.11	0.10	0.06
Al	1.96	2.03	2.16	2.52	2.01	2.47	2.24	1.91	1.98	2.44	2.51	2.13	1.65
Fe^{2+}	1.33	1.25	1.28	1.40	1.33	1.37	1.33	1.31	1.33	1.40	1.37	1.34	1.42
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.83	2.87	2.80	2.55	2.84	2.57	2.69	2.83	2.80	2.56	2.57	2.76	2.84
Ca	1.77	1.76	1.78	1.79	1.82	1.75	1.73	1.73	1.75	1.78	1.75	1.77	1.86
Na	0.67	0.68	0.69	0.77	0.64	0.76	0.74	0.65	0.66	0.73	0.79	0.72	0.46
K	0.03	0.03	0.03	0.05	0.04	0.03	0.04	0.03	0.03	0.04	0.05	0.04	0.03
Cr	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.02	0.01	0.00	0.01
Fe^{3+}	0.29	0.31	0.29	0.30	0.25	0.39	0.38	0.40	0.34	0.27	0.39	0.38	0.27
Zn	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.57	15.58	15.58	15.69	15.58	15.66	15.63	15.53	15.54	15.63	15.71	15.64	15.41

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 5.14	Hbl 5.15	Hbl 5.16	Hbl 5.17	Hbl 5.18	Hbl 5.19	Hbl 5.20	Hbl 5.21	Hbl 5.22	Hbl 5.23	Hbl 5.24	Hbl 5.25	Hbl 5.26
SiO_2	43.95	41.16	43.85	42.40	42.06	42.04	42.77	42.52	42.09	41.95	43.12	43.68	43.77
TiO_2	1.13	1.43	1.45	1.68	1.49	1.36	1.28	1.14	1.02	1.22	1.33	1.07	0.60
Al_2O_3	12.53	15.48	12.21	12.85	13.91	14.56	13.60	13.91	14.60	14.92	13.18	12.29	12.22
Fe*	14.64	14.85	15.02	14.79	14.76	14.58	14.78	14.57	14.72	15.00	14.92	14.84	16.10
MnO	0.08	0.06	0.08	0.11	0.08	0.09	0.08	0.09	0.11	0.10	0.10	0.10	0.12
MgO	12.19	10.89	11.94	11.64	11.10	11.09	11.72	11.49	11.33	10.82	11.53	11.90	11.55
CaO	11.12	11.16	11.15	10.88	11.17	11.62	11.34	11.22	11.16	11.60	11.64	11.06	10.51
Na_2O	2.43	2.91	2.49	2.44	2.69	2.57	2.54	2.72	2.68	2.52	2.40	2.42	2.79
K_2O	0.17	0.25	0.20	0.24	0.19	0.24	0.22	0.21	0.23	0.22	0.23	0.15	0.25
Cr_2O_3	0.04	0.05	0.09	0.07	0.03	0.08	0.06	0.04	0.13	0.11	0.05	0.05	0.02
ZnO	0.03	*n.d.*	0.03	0.02	*n.d.*	0.03	0.03	*n.d.*	0.04	0.01	*n.d.*	0.03	0.04
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.32	98.24	98.52	97.11	97.48	98.27	98.43	97.91	98.12	98.48	98.50	97.59	97.95
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.40	6.04	6.40	6.27	6.22	6.17	6.25	6.24	6.17	6.15	6.31	6.42	6.43
Ti	0.12	0.16	0.16	0.19	0.17	0.15	0.14	0.13	0.11	0.13	0.15	0.12	0.07
Al	2.15	2.68	2.10	2.24	2.42	2.52	2.34	2.41	2.52	2.58	2.27	2.13	2.12
Fe^{2+}	1.40	1.50	1.49	1.43	1.54	1.54	1.45	1.48	1.43	1.55	1.54	1.45	1.52
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.65	2.38	2.60	2.57	2.45	2.43	2.55	2.52	2.47	2.36	2.51	2.61	2.53
Ca	1.73	1.76	1.74	1.72	1.77	1.83	1.77	1.77	1.75	1.82	1.82	1.74	1.65
Na	0.69	0.83	0.70	0.70	0.77	0.73	0.72	0.77	0.76	0.72	0.68	0.69	0.79
K	0.03	0.05	0.04	0.05	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.03	0.05
Cr	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.02	0.01	0.01	0.01	0.00
Fe^{3+}	0.38	0.33	0.34	0.40	0.29	0.25	0.36	0.31	0.37	0.28	0.28	0.37	0.46
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.57	15.73	15.59	15.59	15.66	15.68	15.64	15.67	15.67	15.66	15.63	15.57	15.63

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 5.27	Hbl 5.28	Hbl 5.29	Hbl 7.1	Hbl 7.2	Hbl 7.3	Hbl 7.4	Hbl 7.5	Hbl 7.6	Hbl 7.7	Hbl 7.8	Hbl 7.9	Hbl 7.10
SiO_2	43.60	41.42	42.16	45.74	44.29	45.74	44.85	44.52	44.80	45.18	44.95	45.93	44.97
TiO_2	0.72	1.22	1.28	1.15	1.33	1.10	1.43	1.48	1.31	1.51	1.79	1.45	1.33
Al_2O_3	12.96	15.15	14.59	10.06	11.59	9.74	10.79	11.22	11.45	10.58	10.35	10.12	10.80
Fe*	15.15	15.15	15.22	14.50	14.73	14.86	14.48	14.25	14.27	14.26	14.40	14.56	15.06
MnO	0.11	0.10	0.09	0.07	0.08	0.08	0.06	0.06	0.08	0.08	0.07	0.07	0.09
MgO	11.90	10.65	11.01	12.46	11.92	12.22	12.14	12.39	12.65	12.55	12.45	12.32	11.78
CaO	11.34	11.16	10.94	11.31	11.05	11.60	11.76	11.38	11.04	11.66	11.57	11.47	11.57
Na_2O	2.40	2.75	2.75	1.99	2.33	1.76	2.03	2.28	2.38	2.14	2.15	1.97	2.09
K_2O	0.19	0.24	0.23	0.15	0.15	0.17	0.22	0.15	0.16	0.16	0.15	0.14	0.20
Cr_2O_3	0.08	0.11	0.11	0.11	0.05	0.03	0.05	0.06	0.03	0.07	0.10	0.12	0.12
ZnO	0.03	0.01	*n.d.*	0.01	0.02	0.03	0.03	*n.d.*	0.02	0.02	0.01	0.04	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.49	97.96	98.39	97.55	97.54	97.33	97.83	97.79	98.19	98.21	97.99	98.18	98.04
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.35	6.10	6.17	6.70	6.51	6.74	6.59	6.52	6.51	6.59	6.58	6.70	6.60
Ti	0.08	0.14	0.14	0.13	0.15	0.12	0.16	0.16	0.14	0.17	0.20	0.16	0.15
Al	2.22	2.63	2.52	1.74	2.01	1.69	1.87	1.94	1.96	1.82	1.79	1.74	1.87
Fe^{2+}	1.40	1.54	1.49	1.50	1.49	1.59	1.58	1.47	1.38	1.52	1.54	1.55	1.63
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.58	2.34	2.40	2.72	2.61	2.68	2.66	2.71	2.74	2.73	2.72	2.68	2.58
Ca	1.77	1.76	1.71	1.78	1.74	1.83	1.85	1.79	1.72	1.82	1.82	1.79	1.82
Na	0.68	0.79	0.78	0.57	0.66	0.50	0.58	0.65	0.67	0.61	0.61	0.56	0.59
K	0.04	0.04	0.04	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.04
Cr	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Fe^{3+}	0.44	0.33	0.37	0.28	0.32	0.24	0.19	0.27	0.36	0.23	0.22	0.23	0.22
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.59	15.69	15.65	15.46	15.53	15.44	15.53	15.55	15.53	15.53	15.53	15.45	15.52

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 7.11	Hbl 7.13	Hbl 8.1	Hbl 8.2	Hbl 8.3	Hbl 8.4	Hbl 8.5	Hbl 8.6	Hbl 8.7	Hbl 8.8	Hbl 8.9	Hbl 8.10	Hbl 8.11
SiO_2	44.71	48.58	44.26	44.28	43.55	43.76	44.50	43.64	43.98	42.11	40.81	42.50	41.49
TiO_2	1.23	0.83	0.87	0.81	0.79	0.60	1.04	1.15	1.09	0.64	0.86	0.65	1.24
Al_2O_3	11.02	7.16	11.44	11.65	12.51	12.52	11.39	12.54	12.51	15.08	17.26	15.50	16.30
Fe*	15.17	12.90	14.94	14.90	15.13	14.86	14.82	14.95	14.58	14.99	14.37	14.00	14.09
MnO	0.08	0.07	0.09	0.08	0.12	0.12	0.09	0.12	0.09	0.07	0.07	0.08	0.06
MgO	11.93	13.99	11.93	12.31	11.84	11.92	12.08	11.94	12.10	10.66	10.91	11.85	11.10
CaO	11.62	12.61	11.60	11.28	11.19	11.36	11.42	10.96	11.27	11.02	10.75	10.60	10.85
Na_2O	1.98	1.36	2.17	2.40	2.42	2.48	2.28	2.59	2.43	2.65	2.85	2.77	2.92
K_2O	0.19	0.06	0.16	0.16	0.18	0.20	0.16	0.17	0.18	0.18	0.22	0.19	0.17
Cr_2O_3	0.07	0.08	0.05	0.02	0.10	0.06	0.07	0.10	0.02	0.08	0.07	0.04	0.05
ZnO	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.04	0.04	0.04	0.02	0.05	0.06	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.00	97.66	97.50	97.90	97.82	97.89	97.88	98.20	98.28	97.49	98.23	98.24	98.31
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.56	7.07	6.52	6.48	6.39	6.42	6.53	6.38	6.41	6.21	5.94	6.16	6.04
Ti	0.14	0.09	0.10	0.09	0.09	0.07	0.12	0.13	0.12	0.07	0.09	0.07	0.14
Al	1.90	1.23	1.99	2.01	2.16	2.16	1.97	2.16	2.15	2.62	2.96	2.65	2.80
Fe^{2+}	1.57	1.49	1.53	1.45	1.45	1.48	1.53	1.44	1.44	1.51	1.28	1.20	1.34
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.61	3.04	2.62	2.69	2.59	2.61	2.64	2.60	2.63	2.34	2.37	2.56	2.41
Ca	1.83	1.97	1.83	1.77	1.76	1.79	1.79	1.72	1.76	1.74	1.68	1.65	1.69
Na	0.56	0.38	0.62	0.68	0.69	0.71	0.65	0.73	0.69	0.76	0.80	0.78	0.82
K	0.04	0.01	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.04	0.04	0.03
Cr	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01
Fe^{3+}	0.29	0.08	0.31	0.37	0.41	0.34	0.29	0.39	0.34	0.34	0.47	0.49	0.38
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.51	15.38	15.56	15.59	15.59	15.63	15.56	15.60	15.58	15.63	15.67	15.61	15.66

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 8.12	Hbl 8.13	Hbl 8.14	Hbl 8.15	Hbl 8.16	Hbl 8.17	Hbl 8.18	Hbl 8.19	Hbl 8.20	Hbl 8.21	Hbl 8.22	Hbl 8.23	Hbl 8.24
SiO_2	43.60	41.43	41.97	43.72	43.75	44.17	42.72	43.00	42.66	42.56	42.64	40.40	41.35
TiO_2	0.39	0.70	0.64	0.95	0.85	1.32	0.62	0.94	0.97	0.83	0.57	0.64	0.87
Al_2O_3	14.14	15.41	15.68	12.60	12.26	11.28	13.19	12.94	13.12	13.28	14.24	16.01	16.13
Fe*	14.19	14.53	15.13	14.95	15.54	15.68	16.16	16.16	15.74	15.58	15.87	16.17	14.27
MnO	0.09	0.11	0.09	0.10	0.11	0.11	0.07	0.10	0.12	0.12	0.09	0.10	0.06
MgO	12.34	11.21	10.94	11.69	11.79	11.62	11.11	11.37	11.19	11.37	11.08	10.29	11.32
CaO	10.24	10.63	10.85	11.56	10.98	10.97	11.14	11.31	10.99	10.94	11.00	10.92	11.06
Na_2O	2.65	2.74	2.74	2.23	2.49	2.46	2.48	2.47	2.54	2.53	2.58	2.84	2.70
K_2O	0.23	0.19	0.23	0.16	0.18	0.17	0.17	0.17	0.19	0.21	0.20	0.22	0.28
Cr_2O_3	0.03	0.06	0.02	0.02	0.07	0.06	0.05	0.04	0.04	0.03	0.05	0.03	0.06
ZnO	*n.d.*	*n.d.*	0.04	0.03	*n.d.*	0.03	0.03	0.03	0.03	0.05	*n.d.*	0.02	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.90	97.01	98.34	98.01	98.02	97.87	97.74	98.53	97.59	97.49	98.33	97.63	98.12
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.32	6.11	6.12	6.40	6.41	6.50	6.30	6.29	6.30	6.28	6.24	5.98	6.04
Ti	0.04	0.08	0.07	0.10	0.09	0.15	0.07	0.10	0.11	0.09	0.06	0.07	0.10
Al	2.41	2.68	2.70	2.18	2.12	1.96	2.29	2.23	2.28	2.31	2.45	2.79	2.77
Fe^{2+}	1.16	1.32	1.41	1.49	1.49	1.59	1.51	1.50	1.53	1.45	1.48	1.46	1.31
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Mg	2.66	2.46	2.38	2.55	2.58	2.55	2.44	2.48	2.46	2.50	2.42	2.27	2.46
Ca	1.59	1.68	1.70	1.81	1.72	1.73	1.76	1.77	1.74	1.73	1.72	1.73	1.73
Na	0.74	0.78	0.77	0.63	0.71	0.70	0.71	0.70	0.73	0.72	0.73	0.81	0.76
K	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.05
Cr	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.01
Fe^{3+}	0.56	0.47	0.44	0.34	0.42	0.34	0.48	0.48	0.41	0.47	0.46	0.54	0.43
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.55	15.64	15.65	15.57	15.59	15.57	15.61	15.61	15.62	15.62	15.62	15.71	15.67

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 8.25	Hbl 8.26	Hbl 8.27	Hbl 8.28	Hbl 8.29	Hbl 8.30	Hbl 8.31	Hbl 8.32	Hbl 9.1	Hbl 9.2	Hbl 9.3	Hbl 9.4	Hbl 9.5
SiO_2	41.97	41.33	41.27	40.23	40.88	43.45	42.87	44.74	47.18	43.85	42.61	43.42	42.75
TiO_2	0.90	0.88	1.11	0.94	0.55	1.22	0.69	1.09	0.84	1.08	0.92	0.52	0.81
Al_2O_3	15.55	16.19	16.27	16.43	16.76	13.21	14.46	11.54	8.76	12.12	13.77	13.03	13.51
Fe*	14.29	13.92	14.13	14.12	13.92	13.57	14.30	13.95	14.74	15.05	15.47	15.21	15.54
MnO	0.07	0.03	0.06	0.03	0.10	0.07	0.09	0.09	0.09	0.09	0.08	0.10	0.10
MgO	11.38	11.35	11.27	11.26	10.90	12.57	12.00	12.57	12.86	11.80	11.40	11.52	11.39
CaO	11.02	10.86	10.92	10.83	11.09	11.44	11.00	11.44	11.85	11.51	10.89	11.13	11.20
Na_2O	2.64	2.68	2.77	2.62	2.79	2.56	2.76	2.27	1.57	2.28	2.55	2.48	2.60
K_2O	0.28	0.31	0.23	0.23	0.20	0.17	0.25	0.19	0.13	0.19	0.21	0.17	0.21
Cr_2O_3	0.03	0.03	0.01	0.05	0.05	0.09	0.10	0.07	0.07	0.06	0.09	0.13	0.15
ZnO	*n.d.*	*n.d.*	0.01	0.04	0.04	*n.d.*	0.01	0.01	*n.d.*	0.04	0.02	*n.d.*	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.12	97.57	98.05	96.78	97.28	98.36	98.53	97.96	98.08	98.06	98.01	97.71	98.25
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.12	6.05	6.02	5.94	6.02	6.31	6.22	6.53	6.87	6.43	6.25	6.38	6.27
Ti	0.10	0.10	0.12	0.10	0.06	0.13	0.08	0.12	0.09	0.12	0.10	0.06	0.09
Al	2.67	2.79	2.80	2.86	2.91	2.26	2.47	1.98	1.50	2.09	2.38	2.26	2.33
Fe^{2+}	1.34	1.28	1.31	1.18	1.34	1.33	1.32	1.42	1.54	1.52	1.44	1.49	1.49
Mn	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.47	2.48	2.45	2.48	2.39	2.72	2.60	2.73	2.79	2.58	2.49	2.52	2.49
Ca	1.72	1.70	1.71	1.71	1.75	1.78	1.71	1.79	1.85	1.81	1.71	1.75	1.76
Na	0.75	0.76	0.78	0.75	0.80	0.72	0.78	0.64	0.44	0.65	0.72	0.71	0.74
K	0.05	0.06	0.04	0.04	0.04	0.03	0.05	0.03	0.02	0.03	0.04	0.03	0.04
Cr	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
Fe^{3+}	0.40	0.43	0.42	0.56	0.37	0.32	0.42	0.28	0.26	0.32	0.46	0.38	0.42
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.64	15.65	15.66	15.64	15.70	15.63	15.66	15.55	15.39	15.58	15.61	15.61	15.65

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 9.6	Hbl 9.7	Hbl 9.8	Hbl 9.9	Hbl 9.10	Hbl 9.11	Hbl 9.12	Hbl 9.13	Hbl 9.14	Hbl 9.15	Hbl 9.16	Hbl 9.17	Hbl 9.18
SiO_2	43.49	42.52	41.95	41.60	42.21	42.43	43.86	41.85	41.77	41.98	43.19	44.23	44.45
TiO_2	0.70	0.48	0.73	0.48	0.54	0.55	0.49	0.57	0.53	0.46	0.53	0.42	0.40
Al_2O_3	12.98	13.77	14.29	14.85	13.85	13.80	11.44	14.48	14.78	14.37	12.41	11.08	10.88
Fe*	16.24	16.23	16.11	16.79	16.84	16.54	17.70	16.75	16.83	16.75	16.98	16.56	17.20
MnO	0.11	0.09	0.12	0.09	0.11	0.09	0.10	0.09	0.11	0.09	0.07	0.11	0.11
MgO	11.39	11.04	10.41	10.26	10.64	10.92	11.16	10.47	10.34	10.48	11.20	11.66	11.54
CaO	10.85	10.80	10.96	10.76	10.73	10.82	10.83	10.84	10.81	10.65	10.81	10.82	10.83
Na_2O	2.41	2.55	2.64	2.76	2.59	2.63	2.38	2.77	2.72	2.62	2.48	2.25	2.26
K_2O	0.19	0.18	0.21	0.21	0.26	0.21	0.16	0.21	0.20	0.20	0.13	0.19	0.14
Cr_2O_3	0.03	0.07	0.08	0.06	0.04	*n.d.*	0.04	0.06	0.03	0.06	0.09	*n.d.*	0.01
ZnO	0.02	*n.d.*	0.03	0.02	0.07	0.02	0.01	0.02	0.03	0.01	0.05	*n.d.*	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.41	97.73	97.52	97.88	97.87	98.01	98.17	98.11	98.15	97.67	97.94	97.31	97.86
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.35	6.26	6.22	6.15	6.23	6.24	6.45	6.17	6.15	6.20	6.36	6.53	6.54
Ti	0.08	0.05	0.08	0.05	0.06	0.06	0.05	0.06	0.06	0.05	0.06	0.05	0.04
Al	2.23	2.39	2.50	2.59	2.41	2.39	1.98	2.52	2.57	2.50	2.15	1.93	1.89
Fe^{2+}	1.47	1.46	1.61	1.58	1.54	1.51	1.58	1.58	1.56	1.53	1.50	1.51	1.53
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.48	2.42	2.30	2.26	2.34	2.39	2.45	2.30	2.27	2.31	2.46	2.57	2.53
Ca	1.70	1.70	1.74	1.70	1.70	1.71	1.71	1.71	1.71	1.69	1.70	1.71	1.71
Na	0.68	0.73	0.76	0.79	0.74	0.75	0.68	0.79	0.78	0.75	0.71	0.64	0.64
K	0.04	0.03	0.04	0.04	0.05	0.04	0.03	0.04	0.04	0.04	0.02	0.04	0.03
Cr	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.00
Fe^{3+}	0.51	0.53	0.39	0.49	0.54	0.53	0.60	0.49	0.51	0.54	0.59	0.54	0.58
Zn	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.56	15.60	15.66	15.67	15.63	15.63	15.55	15.68	15.66	15.62	15.58	15.53	15.52

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 9.19	Hbl 9.20	Hbl 9.21	Hbl 9.22	Hbl 9.23	Hbl 9.24	Hbl 9.25	Hbl 9.26	Hbl 10.1	Hbl 10.2	Hbl 10.3	Hbl 10.4	Hbl 10.5
SiO_2	44.49	43.89	42.74	41.75	40.09	42.06	42.79	43.99	46.30	43.91	43.56	43.35	43.32
TiO_2	0.36	0.44	0.51	0.43	0.31	1.67	1.49	0.96	1.11	0.87	0.91	1.00	0.78
Al_2O_3	10.80	11.15	13.03	14.65	16.90	13.99	12.84	11.34	10.28	12.28	12.44	13.06	13.46
Fe*	17.02	16.81	16.61	16.67	17.33	15.29	15.32	16.12	13.54	14.95	15.18	15.11	14.67
MnO	0.10	0.09	0.10	0.12	0.13	0.08	0.10	0.11	0.07	0.11	0.10	0.08	0.11
MgO	11.52	11.71	11.07	10.38	9.50	11.04	11.19	11.49	13.15	12.06	12.08	11.81	11.86
CaO	10.66	10.66	10.72	10.64	10.89	11.15	11.18	11.09	11.82	10.97	11.27	11.43	11.47
Na_2O	2.18	2.40	2.61	2.70	2.73	2.58	2.49	2.28	1.80	2.46	2.45	2.45	2.34
K_2O	0.17	0.20	0.23	0.22	0.22	0.21	0.18	0.18	0.14	0.21	0.17	0.18	0.19
Cr_2O_3	0.03	0.03	0.04	0.03	0.02	0.08	0.09	0.06	0.08	0.03	0.09	0.08	0.05
ZnO	0.03	*n.d.*	0.02	*n.d.*	0.03	0.03	*n.d.*	0.01	0.01	0.02	*n.d.*	0.04	0.01
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.36	97.39	97.68	97.58	98.16	98.17	97.67	97.63	98.29	97.88	98.25	98.59	98.26
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.57	6.48	6.31	6.18	5.91	6.18	6.32	6.49	6.70	6.43	6.36	6.32	6.31
Ti	0.04	0.05	0.06	0.05	0.03	0.18	0.17	0.11	0.12	0.10	0.10	0.11	0.09
Al	1.88	1.94	2.27	2.55	2.94	2.42	2.23	1.97	1.75	2.12	2.14	2.24	2.31
Fe^{2+}	1.53	1.48	1.53	1.55	1.50	1.53	1.58	1.60	1.40	1.42	1.40	1.44	1.38
Mn	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.54	2.58	2.44	2.29	2.09	2.42	2.46	2.53	2.84	2.63	2.63	2.57	2.58
Ca	1.69	1.69	1.70	1.69	1.72	1.76	1.77	1.75	1.83	1.72	1.76	1.78	1.79
Na	0.62	0.69	0.75	0.77	0.78	0.73	0.71	0.65	0.51	0.70	0.69	0.69	0.66
K	0.03	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.04	0.03	0.03	0.04
Cr	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
Fe^{3+}	0.57	0.59	0.52	0.51	0.64	0.34	0.31	0.39	0.24	0.41	0.45	0.40	0.41
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.49	15.56	15.63	15.65	15.67	15.63	15.61	15.56	15.44	15.58	15.60	15.61	15.59

Mineral						Amphibole							
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 10.6	Hbl 10.7	Hbl 10.8	Hbl 10.9	Hbl 10.10	Hbl 10.11	Hbl 10.12	Hbl 10.13	Hbl 10.14	Hbl 10.15	Hbl 10.16	Hbl 10.17	Hbl 10.18
SiO_2	42.87	40.55	40.72	39.25	39.04	39.04	41.90	40.59	39.63	42.92	42.41	44.91	43.68
TiO_2	0.91	0.66	0.94	1.28	0.68	0.56	0.68	0.87	0.85	0.60	0.90	0.75	0.74
Al_2O_3	13.69	15.48	16.58	18.24	19.07	18.69	15.49	17.26	17.97	13.83	14.32	11.30	12.24
Fe*	14.52	16.35	16.17	15.86	17.00	17.08	15.59	16.00	16.02	15.42	15.50	16.05	16.14
MnO	0.08	0.11	0.10	0.11	0.15	0.14	0.12	0.10	0.12	0.09	0.09	0.09	0.08
MgO	11.93	10.31	9.78	9.46	8.42	8.23	10.62	9.73	9.66	11.39	11.09	11.81	11.38
CaO	11.68	10.72	11.33	10.98	11.17	10.62	11.20	11.06	10.58	11.08	10.91	11.33	11.54
Na_2O	2.28	2.80	2.62	2.94	2.72	2.62	2.66	2.78	2.72	2.59	2.75	2.09	2.18
K_2O	0.21	0.27	0.27	0.29	0.25	0.25	0.22	0.21	0.28	0.22	0.16	0.14	0.15
Cr_2O_3	0.09	0.08	0.07	0.06	0.02	0.08	0.02	0.02	0.05	0.06	0.09	0.05	0.03
ZnO	0.03	0.02	*n.d.*	0.05	0.02	0.03	0.04	*n.d.*	0.02	0.03	0.02	0.03	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.29	97.36	98.59	98.51	98.55	97.35	98.54	98.62	97.90	98.23	98.24	98.55	98.16
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.25	6.02	5.98	5.77	5.75	5.81	6.13	5.95	5.83	6.28	6.21	6.54	6.41
Ti	0.10	0.07	0.10	0.14	0.08	0.06	0.07	0.10	0.09	0.07	0.10	0.08	0.08
Al	2.35	2.71	2.87	3.16	3.31	3.28	2.67	2.98	3.12	2.38	2.47	1.94	2.12
Fe^{2+}	1.32	1.48	1.60	1.54	1.64	1.65	1.52	1.56	1.42	1.47	1.49	1.53	1.53
Mn	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01
Mg	2.59	2.28	2.14	2.07	1.85	1.83	2.32	2.12	2.12	2.48	2.42	2.57	2.49
Ca	1.82	1.71	1.78	1.73	1.76	1.69	1.75	1.74	1.67	1.74	1.71	1.77	1.81
Na	0.64	0.81	0.75	0.84	0.78	0.76	0.75	0.79	0.78	0.73	0.78	0.59	0.62
K	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.05	0.04	0.03	0.03	0.03
Cr	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00
Fe^{3+}	0.45	0.55	0.39	0.41	0.45	0.48	0.39	0.40	0.55	0.42	0.41	0.43	0.45
Zn	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.59	15.70	15.68	15.75	15.70	15.64	15.66	15.68	15.65	15.64	15.65	15.49	15.55

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 10.19	Hbl 10.20	Hbl 10.21	Hbl 10.22	Hbl 11.1	Hbl 11.2	Hbl 11.3	Hbl 11.4	Hbl 11.5	Hbl 11.6	Hbl 11.7	Hbl 11.8	Hbl 11.9
SiO_2	43.46	42.91	43.01	43.43	46.66	44.60	44.23	43.33	43.35	42.51	41.16	42.13	43.93
TiO_2	0.60	0.72	0.70	0.78	0.57	0.73	0.87	1.18	1.22	0.68	0.83	1.06	1.24
Al_2O_3	12.31	13.66	12.77	12.66	9.76	11.90	12.65	13.69	14.38	14.94	16.70	15.12	13.37
Fe*	16.04	15.57	15.87	15.71	14.74	14.49	14.39	13.66	13.80	14.38	14.91	15.09	13.14
MnO	0.11	0.09	0.12	0.11	0.10	0.11	0.11	0.09	0.10	0.09	0.08	0.09	0.04
MgO	11.07	11.43	11.51	11.47	12.82	12.44	12.33	12.36	11.42	11.72	10.96	11.21	12.82
CaO	11.34	11.18	11.13	11.17	11.97	11.50	11.18	11.51	10.99	10.93	11.03	11.03	10.93
Na_2O	2.16	2.52	2.54	2.55	1.80	2.23	2.44	2.43	2.62	2.73	2.89	2.75	2.53
K_2O	0.19	0.18	0.20	0.20	0.12	0.18	0.25	0.21	0.22	0.23	0.24	0.22	0.16
Cr_2O_3	0.02	0.06	0.06	0.10	0.03	0.09	0.06	0.05	0.08	0.06	0.09	0.07	0.06
ZnO	0.03	0.03	0.05	*n.d.*	0.02	*n.d.*	0.02	0.05	0.05	0.02	0.04	*n.d.*	0.03
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.32	98.36	97.97	98.17	98.58	98.27	98.53	98.55	98.22	98.29	98.93	98.77	98.25
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.43	6.27	6.32	6.37	6.76	6.49	6.42	6.28	6.31	6.18	5.98	6.13	6.35
Ti	0.07	0.08	0.08	0.09	0.06	0.08	0.10	0.13	0.13	0.07	0.09	0.12	0.13
Al	2.15	2.35	2.21	2.19	1.67	2.04	2.16	2.34	2.47	2.56	2.86	2.59	2.28
Fe^{2+}	1.57	1.44	1.47	1.56	1.49	1.40	1.38	1.32	1.41	1.32	1.37	1.43	1.19
Mn	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Mg	2.44	2.49	2.52	2.51	2.77	2.70	2.67	2.67	2.48	2.54	2.37	2.43	2.76
Ca	1.80	1.75	1.75	1.76	1.86	1.79	1.74	1.79	1.71	1.70	1.72	1.72	1.69
Na	0.62	0.71	0.72	0.73	0.51	0.63	0.69	0.68	0.74	0.77	0.81	0.78	0.71
K	0.03	0.03	0.04	0.04	0.02	0.03	0.05	0.04	0.04	0.04	0.04	0.04	0.03
Cr	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fe^{3+}	0.41	0.46	0.48	0.37	0.30	0.37	0.37	0.34	0.27	0.43	0.44	0.41	0.39
Zn	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.55	15.61	15.63	15.63	15.45	15.55	15.58	15.61	15.58	15.65	15.71	15.66	15.55

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 11.10	Hbl 11.11	Hbl 11.12	Hbl 11.13	Hbl 11.14	Hbl 11.15	Hbl 11.16	Hbl 11.17	Hbl 11.18	Hbl 11.19	Hbl 11.20	Hbl 11.21	Hbl 11.22
SiO_2	43.79	43.03	42.44	42.93	40.58	42.20	41.41	42.20	42.64	42.90	43.00	42.24	44.44
TiO_2	1.13	1.22	0.54	0.57	0.52	0.49	0.51	1.15	0.86	1.03	0.64	0.79	0.61
Al_2O_3	13.60	13.73	14.37	13.48	15.18	14.48	15.79	13.71	13.27	12.83	12.82	13.29	11.26
Fe*	12.94	14.34	16.26	16.19	16.41	16.40	16.45	16.45	16.49	16.66	16.79	16.97	16.48
MnO	0.05	0.03	0.10	0.10	0.09	0.10	0.07	0.08	0.10	0.10	0.09	0.08	0.09
MgO	12.80	12.11	10.58	11.20	9.85	10.92	10.33	10.52	10.84	10.98	10.89	10.58	11.43
CaO	11.27	10.95	10.79	10.67	10.25	10.66	10.86	11.17	10.69	10.69	10.89	11.17	11.20
Na_2O	2.40	2.60	2.62	2.55	2.61	2.59	2.67	2.58	2.61	2.56	2.44	2.41	2.23
K_2O	0.19	0.25	0.20	0.22	0.22	0.20	0.19	0.19	0.17	0.18	0.20	0.16	0.12
Cr_2O_3	0.02	0.04	0.10	0.05	0.01	0.02	0.04	0.10	0.04	0.05	0.10	0.03	0.02
ZnO	0.05	0.01	0.03	0.03	0.01	0.02	*n.d.*	0.04	0.04	0.03	0.07	0.02	0.04
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.24	98.32	98.02	98.00	95.73	98.08	98.33	98.19	97.75	98.01	97.93	97.75	97.93
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.33	6.26	6.24	6.30	6.11	6.18	6.07	6.23	6.29	6.32	6.34	6.25	6.54
Ti	0.12	0.13	0.06	0.06	0.06	0.05	0.06	0.13	0.10	0.11	0.07	0.09	0.07
Al	2.32	2.35	2.49	2.33	2.69	2.50	2.73	2.38	2.31	2.23	2.23	2.32	1.95
Fe^{2+}	1.21	1.33	1.55	1.47	1.54	1.42	1.48	1.66	1.57	1.58	1.57	1.58	1.60
Mn	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.76	2.63	2.32	2.45	2.21	2.39	2.26	2.31	2.39	2.41	2.39	2.33	2.51
Ca	1.75	1.71	1.70	1.68	1.65	1.67	1.71	1.77	1.69	1.69	1.72	1.77	1.77
Na	0.67	0.73	0.75	0.73	0.76	0.74	0.76	0.74	0.75	0.73	0.70	0.69	0.64
K	0.04	0.05	0.04	0.04	0.04	0.04	0.03	0.04	0.03	0.03	0.04	0.03	0.02
Cr	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Fe^{3+}	0.35	0.41	0.45	0.51	0.53	0.59	0.54	0.37	0.47	0.48	0.50	0.52	0.42
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.56	15.61	15.62	15.60	15.62	15.60	15.64	15.65	15.61	15.60	15.59	15.60	15.53

Mineral							Amphibole						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Hbl 11.23	11.24	Hbl 11.25	Hbl 11.26	Hbl 11.27	Hbl 11.28	Hbl 11.29	Hbl 11.30	Hbl 11.31	Hbl 11.32	Hbl 11.33	Hbl 11.34	Hbl 11.35
SiO_2	42.62	42.98	43.17	42.91	43.09	43.24	42.45	42.01	41.66	44.55	41.20	42.66	43.34
TiO_2	0.78	0.89	0.74	0.61	0.58	0.74	0.66	0.71	0.72	0.59	0.83	0.29	0.74
Al_2O_3	12.97	12.43	12.75	13.02	12.99	12.53	13.91	14.08	15.41	12.55	15.77	14.79	12.97
Fe*	17.48	17.24	16.96	17.03	16.90	16.89	16.43	16.33	16.38	14.57	16.32	15.39	16.55
MnO	0.12	0.12	0.10	0.10	0.11	0.10	0.10	0.11	0.10	0.07	0.09	0.10	0.08
MgO	10.40	10.55	11.02	10.79	10.90	10.96	10.96	10.68	10.08	12.16	10.04	11.02	11.19
CaO	11.05	10.78	10.57	10.51	10.80	10.74	10.85	10.72	10.75	11.15	11.14	11.18	10.64
Na_2O	2.45	2.48	2.56	2.54	2.50	2.37	2.63	2.54	2.60	2.30	2.68	2.43	2.49
K_2O	0.16	0.14	0.16	0.17	0.18	0.18	0.15	0.19	0.20	0.11	0.23	0.20	0.17
Cr_2O_3	0.03	0.05	0.04	0.01	*n.d.*	0.06	0.09	*n.d.*	0.04	0.11	0.12	0.13	0.01
ZnO	0.01	*n.d.*	0.02	0.04	*n.d.*	0.03	0.01	0.04	0.03	0.02	0.01	0.01	*n.d.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.07	97.66	98.09	97.73	98.05	97.84	98.24	97.40	97.96	98.18	98.41	98.20	98.18
Oxygens	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
Si	6.30	6.37	6.35	6.33	6.34	6.37	6.23	6.21	6.13	6.47	6.06	6.23	6.35
Ti	0.09	0.10	0.08	0.07	0.06	0.08	0.07	0.08	0.08	0.06	0.09	0.03	0.08
Al	2.26	2.17	2.21	2.26	2.25	2.18	2.40	2.45	2.67	2.15	2.73	2.55	2.24
Fe^{2+}	1.66	1.69	1.56	1.57	1.57	1.56	1.49	1.51	1.57	1.39	1.60	1.43	1.52
Mn	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mg	2.29	2.33	2.42	2.37	2.39	2.41	2.40	2.36	2.21	2.63	2.20	2.40	2.44
Ca	1.75	1.71	1.67	1.66	1.70	1.70	1.71	1.70	1.70	1.74	1.76	1.75	1.67
Na	0.70	0.71	0.73	0.73	0.71	0.68	0.75	0.73	0.74	0.65	0.76	0.69	0.71
K	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.02	0.04	0.04	0.03
Cr	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00
Fe^{3+}	0.50	0.44	0.52	0.53	0.51	0.52	0.53	0.51	0.45	0.38	0.41	0.45	0.51
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.60	15.59	15.58	15.58	15.59	15.55	15.62	15.60	15.61	15.52	15.68	15.59	15.56

Mineral			Amphibole							Plagioclase			
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Hbl 11.36	Hbl 11.37	Hbl 11.38	Hbl 11.39	Hbl 11.40	Plg 1.1	Plg 1.2	Plg 1.2a	Plg 1.3	Plg 1.3a	Plg 1.4	Plg 1.5	Plg 1.6
SiO_2	43.79	42.75	43.56	43.54	43.64	62.19	61.72	61.51	62.45	62.46	60.34	62.60	60.21
TiO_2	0.76	1.19	0.91	0.85	0.88	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.02	0.01
Al_2O_3	12.65	12.59	11.75	12.14	11.71	24.40	24.34	24.98	24.14	24.35	25.42	24.21	25.62
Fe*	15.63	16.18	16.01	16.37	16.40	0.05	0.10	0.08	0.08	0.09	0.10	0.07	0.06
MnO	0.07	0.07	0.09	0.08	0.10	*n.d.*	0.01	*n.d.*	*n.d.*	0.01	*n.d.*	0.01	*n.d.*
MgO	11.61	10.80	11.53	11.14	11.46	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	11.19	11.18	11.43	10.88	11.00	4.85	5.02	5.69	4.61	5.12	6.03	4.67	6.03
Na_2O	2.43	2.50	2.30	2.47	2.45	8.79	8.71	8.24	9.01	8.67	8.20	8.87	8.08
K_2O	0.17	0.13	0.19	0.20	0.18	0.08	0.10	0.06	0.08	0.10	0.09	0.08	0.08
Cr_2O_3	0.03	0.06	0.04	0.08	0.07	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	0.02	0.01	*n.d.*	0.02	*n.d.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.d.*	0.07	*n.d.*	0.05	0.06	*n.d.*	*n.d.*	*n.d.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.07	0.07	0.05	0.02	0.05	0.06	0.08	0.04
Total	98.35	97.46	97.81	97.77	97.89	100.43	100.13	100.62	100.44	100.90	100.24	100.61	100.13
Oxygens	23.00	23.00	23.00	23.00	23.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	6.40	6.35	6.42	6.43	6.43	2.75	2.74	2.71	2.76	2.75	2.68	2.76	2.68
Ti	0.08	0.13	0.10	0.09	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	2.18	2.20	2.04	2.11	2.03	1.27	1.27	1.30	1.26	1.26	1.33	1.26	1.34
Fe^{2+}	1.52	1.68	1.55	1.61	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	2.53	2.39	2.53	2.45	2.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	1.75	1.78	1.81	1.72	1.74	0.23	0.24	0.27	0.22	0.24	0.29	0.22	0.29
Na	0.69	0.72	0.66	0.71	0.70	0.75	0.75	0.70	0.77	0.74	0.71	0.76	0.70
K	0.03	0.02	0.04	0.04	0.03	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00
Cr	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.39	0.33	0.42	0.41	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	15.59	15.62	15.59	15.59	15.59	5.00	5.01	5.00	5.01	5.00	5.02	5.00	5.01

Mineral							Plagioclase						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Plg 1.6a	Plg 1.7	Plg 1.7a	Plg 1.8	Plg 1.9	Plg 1.10	Plg 1.11	Plg 2.6	Plg 5.1	Plg 5.2	Plg 5.3	Plg 5.4	Plg 5.5
SiO_2	63.11	61.19	61.20	63.10	60.81	59.90	60.17	64.22	60.42	62.17	61.42	61.57	60.74
TiO_2	*n.d.*	*n.d.*	0.04	0.06	*n.d.*	*n.d.*	*n.d.*	0.01	0.01	0.05	*n.d.*	0.01	*n.d.*
Al_2O_3	23.83	24.89	25.28	23.31	25.27	25.79	25.27	23.24	24.58	24.06	24.71	24.53	25.17
Fe*	0.09	0.09	0.03	0.06	0.10	0.05	0.07	0.02	0.27	0.10	0.28	0.13	0.06
MnO	0.01	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	0.02	0.01	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.20	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	4.37	5.42	5.97	3.93	5.89	6.54	5.99	3.89	6.05	4.82	5.30	5.13	5.95
Na_2O	9.02	8.45	8.17	9.21	7.97	8.07	8.07	9.20	8.14	9.11	8.32	8.59	8.10
K_2O	0.06	0.06	0.07	0.13	0.04	0.08	0.07	0.10	0.08	0.13	0.12	0.10	0.07
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.03	*n.d.*	0.05	0.04	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*
SrO	0.10	0.05	0.07	0.02	0.02	0.09	0.13	0.09	0.07	0.05	0.07	0.02	0.07
Total	100.62	100.14	100.89	99.87	100.10	100.52	99.79	100.77	99.82	100.52	100.24	100.10	100.16
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.78	2.71	2.70	2.79	2.70	2.66	2.68	2.81	2.70	2.75	2.72	2.73	2.70
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.24	1.30	1.31	1.22	1.32	1.35	1.33	1.20	1.29	1.25	1.29	1.28	1.32
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Ca	0.21	0.26	0.28	0.19	0.28	0.31	0.29	0.18	0.29	0.23	0.25	0.24	0.28
Na	0.77	0.73	0.70	0.79	0.69	0.69	0.70	0.78	0.70	0.78	0.71	0.74	0.70
K	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.01	5.00	5.00	4.99	5.02	5.01	4.99	5.02	5.02	5.00	5.01	5.00

Mineral							Plagioclase						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Plg 5.6	Plg 5.7	Plg 5.8	Plg 5.9	Plg 5.10	Plg 5.11	Plg 5.12	Plg 5.13	Plg 5.14	Plg 5.15	Plg 5.16	Plg 5.17	Plg 6.1
SiO_2	60.71	61.33	62.02	60.19	63.00	60.01	61.23	60.68	60.01	60.17	61.05	60.16	63.21
TiO_2	*n.d.*	*n.d.*	0.04	0.08	0.02	0.06	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01
Al_2O_3	25.31	24.55	23.82	25.31	23.86	25.52	24.70	25.35	25.63	25.31	24.61	25.76	23.36
Fe*	0.12	0.09	0.17	0.03	0.05	0.04	0.06	0.03	0.29	0.21	0.24	0.30	0.15
MnO	*n.d.*	*n.d.*	0.01	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	0.01	0.01	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	5.71	5.08	4.48	6.27	4.31	6.12	5.29	5.87	6.31	6.32	5.49	6.25	3.93
Na_2O	8.19	8.46	8.79	7.99	8.93	8.01	8.36	8.11	7.97	7.93	8.47	7.79	9.20
K_2O	0.08	0.09	0.09	0.05	0.11	0.08	0.10	0.10	0.09	0.08	0.08	0.11	0.13
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.02	*n.d.*	0.06	0.03	0.10	*n.d.*	0.06	0.01	0.04	*n.d.*	*n.d.*	*n.d.*
SrO	0.08	0.05	0.06	0.07	0.09	0.09	0.08	0.06	0.08	0.08	0.07	0.06	0.06
Total	100.20	99.67	99.47	100.06	100.40	100.03	99.81	100.28	100.40	100.15	100.02	100.43	100.05
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.69	2.73	2.76	2.68	2.78	2.67	2.72	2.69	2.67	2.68	2.72	2.67	2.79
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.32	1.29	1.25	1.33	1.24	1.34	1.29	1.33	1.34	1.33	1.29	1.35	1.22
Fe^{2+}	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.27	0.24	0.21	0.30	0.20	0.29	0.25	0.28	0.30	0.30	0.26	0.30	0.19
Na	0.70	0.73	0.76	0.69	0.76	0.69	0.72	0.70	0.69	0.68	0.73	0.67	0.79
K	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	5.01	4.99	5.01	5.00	5.00	5.01	5.01	5.01	5.00	5.00

Mineral						Plagioclase							
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Plg 6.2	Plg 6.3	Plg 6.4	Plg 6.5	Plg 6.6	Plg 7.4	Plg 7.5	Plg 7.7	Plg 7.8	Plg 7.10	Plg 8.1	Plg 8.2	Plg 8.3
SiO_2	61.96	62.40	60.98	61.37	61.03	61.46	62.71	63.38	62.67	64.52	59.83	60.72	60.19
TiO_2	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	0.07	0.02	*n.d.*	0.07	*n.d.*	0.02	0.06
Al_2O_3	24.58	23.80	25.10	24.56	24.78	25.15	24.15	23.83	24.41	23.20	25.50	25.45	25.58
Fe*	0.27	0.17	0.06	0.12	0.19	0.05	0.05	0.11	0.06	0.01	0.29	0.11	0.26
MnO	*n.d.*	*n.d.*	0.02	0.02	*n.d.*	0.01	*n.d.*	*n.d.*	0.01	0.01	0.01	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	5.00	4.48	5.68	5.05	5.47	6.02	4.84	4.45	5.01	3.60	6.49	5.95	6.24
Na_2O	8.51	9.02	8.34	8.64	8.40	8.09	8.88	8.94	8.66	9.20	7.66	8.22	7.77
K_2O	0.08	0.09	0.06	0.11	0.10	0.10	0.09	0.11	0.09	0.16	0.06	0.09	0.09
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	*n.d.*	0.01	0.06	0.04	*n.d.*	*n.d.*	*n.d.*	0.03	0.04	0.14	0.03	0.02
SrO	0.03	0.03	0.05	0.07	0.06	0.10	0.07	0.04	0.05	0.05	0.03	0.04	0.02
Total	100.42	99.99	100.30	99.99	100.09	100.98	100.86	100.88	100.98	100.85	100.01	100.64	100.23
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.74	2.77	2.70	2.73	2.71	2.71	2.76	2.78	2.75	2.82	2.67	2.69	2.67
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.28	1.24	1.31	1.29	1.30	1.30	1.25	1.23	1.26	1.20	1.34	1.33	1.34
Fe^{2+}	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.24	0.21	0.27	0.24	0.26	0.28	0.23	0.21	0.24	0.17	0.31	0.28	0.30
Na	0.73	0.78	0.72	0.74	0.72	0.69	0.76	0.76	0.74	0.78	0.66	0.70	0.67
K	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.01	5.01	5.01	5.01	5.00	5.00	4.99	4.99	4.98	5.00	5.01	5.00

Mineral							Plagioclase						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Plg 8.4	Plg 8.5	Plg 8.6	Plg 10.2	Plg 10.3	Plg 11.1	Plg 12.1	Plg 12.2	Plg 12.3	Plg 12.3a	Plg 12.4	Plg 12.5	Plg 12.6
SiO_2	62.32	61.51	60.22	60.72	60.39	59.71	60.77	59.86	62.34	63.82	62.25	59.25	57.99
TiO_2	0.01	*n.d.*	*n.d.*	0.02	0.03	0.07	*n.d.*	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	0.03
Al_2O_3	24.48	24.79	25.52	25.66	25.80	26.18	25.43	26.23	24.35	23.56	23.93	26.49	17.83
Fe*	0.24	0.17	0.23	0.09	0.10	0.12	0.06	0.08	0.11	0.09	0.17	0.10	3.35
MnO	*n.d.*	0.02	*n.d.*	*n.d.*	0.01	*n.d.*	0.02	0.02	0.02	*n.d.*	*n.d.*	*n.d.*	0.04
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	4.34
CaO	4.76	5.22	6.00	6.48	6.62	7.12	5.90	7.12	4.71	4.24	4.81	7.15	11.86
Na_2O	8.78	8.64	8.13	7.69	7.75	7.36	7.97	7.42	8.91	9.00	8.71	7.46	5.55
K_2O	0.11	0.18	0.09	0.15	0.09	0.12	0.12	0.07	0.15	0.14	0.10	0.11	0.07
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	0.01	0.04	0.05	0.03	0.02	*n.d.*	0.01	*n.d.*
SrO	0.06	0.07	0.06	0.12	0.03	0.10	0.08	0.09	0.07	0.06	0.03	0.05	0.03
Total	100.76	100.61	100.25	100.97	100.83	100.79	100.38	100.94	100.69	100.96	100.00	100.61	101.09
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.74	2.72	2.68	2.68	2.67	2.64	2.69	2.65	2.75	2.79	2.76	2.63	2.65
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.27	1.29	1.34	1.33	1.34	1.37	1.33	1.37	1.26	1.22	1.25	1.39	0.96
Fe^{2+}	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.13
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
Ca	0.22	0.25	0.29	0.31	0.31	0.34	0.28	0.34	0.22	0.20	0.23	0.34	0.58
Na	0.75	0.74	0.70	0.66	0.66	0.63	0.68	0.64	0.76	0.76	0.75	0.64	0.49
K	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.02	5.01	4.99	5.00	5.00	5.00	5.00	5.01	4.99	5.00	5.01	5.12

Mineral							Plagioclase						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Plg 12.7	Plg 12.8	Plg 12.9	Plg 12.10	Plg 13.1	Plg 13.2	Plg 13.2a	Plg 13.3	Plg 13.3a	Plg 13.4	Plg 13.5	Plg 13.6	Plg 13.7
SiO_2	61.77	62.37	60.17	60.33	62.55	64.63	63.26	63.83	64.99	61.63	64.47	65.03	65.19
TiO_2	0.03	0.02	*n.d.*	0.04	0.05	0.03	0.08	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
Al_2O_3	24.53	24.16	25.61	23.64	23.72	22.71	23.56	23.49	22.79	24.67	22.75	22.42	22.31
Fe*	0.15	0.10	0.09	0.79	*n.d.*	0.06	0.03	0.14	*n.d.*	0.05	0.07	0.01	0.05
MnO	*n.d.*	*n.d.*	*n.d.*	0.02	0.02	*n.d.*	0.02	*n.d.*	*n.d.*	0.01	0.01	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	0.79	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*
CaO	5.08	4.80	6.24	6.73	4.58	3.12	4.46	3.84	3.16	5.26	2.99	2.86	2.76
Na_2O	8.66	8.87	8.00	7.57	8.94	9.66	9.12	9.42	9.63	8.61	9.88	10.03	9.90
K_2O	0.11	0.11	0.13	0.22	0.16	0.15	0.14	0.14	0.14	0.13	0.13	0.19	0.20
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	*n.d.*	*n.d.*	0.05	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*
SrO	0.06	0.03	0.03	0.01	0.09	0.09	0.09	0.02	0.06	0.02	0.03	0.06	0.05
Total	100.39	100.46	100.27	100.18	100.11	100.47	100.78	100.88	100.77	100.38	100.32	100.62	100.46
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.73	2.75	2.67	2.70	2.77	2.84	2.78	2.80	2.84	2.73	2.83	2.85	2.86
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.28	1.26	1.34	1.25	1.24	1.17	1.22	1.21	1.17	1.29	1.18	1.16	1.15
Fe^{2+}	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.24	0.23	0.30	0.32	0.22	0.15	0.21	0.18	0.15	0.25	0.14	0.13	0.13
Na	0.74	0.76	0.69	0.66	0.77	0.82	0.78	0.80	0.82	0.74	0.84	0.85	0.84
K	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.01	5.01	5.01	5.02	5.00	5.00	5.00	5.01	4.99	5.01	5.01	5.01	5.00

Mineral							Plagioclase						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Plg 13.8	Plg 13.9	Plg 13.10	Plg 13.11	Plg 13.12	Plg 13.13	Plg 13.14	Plg 14.3	Plg 15.4	Plg 15.5	Plg 15.7	Plg 15.8	Plg 15.9
SiO_2	63.85	64.14	61.97	64.10	64.54	64.98	64.11	63.92	63.63	64.57	61.58	61.65	62.34
TiO_2	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	0.05	0.01	0.02	0.01	*n.d.*	*n.d.*	*n.d.*
Al_2O_3	23.24	23.47	24.62	23.03	22.61	22.61	22.77	23.47	23.53	22.94	24.90	24.54	24.32
Fe*	0.11	0.01	0.03	0.08	0.04	0.05	0.12	0.19	0.08	0.03	0.23	0.09	0.20
MnO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	3.59	3.75	5.03	3.41	2.84	2.91	3.14	3.88	4.08	3.52	5.63	5.46	5.26
Na_2O	9.49	9.40	8.64	9.27	9.77	9.72	9.96	9.25	9.36	9.52	8.38	8.35	8.53
K_2O	0.14	0.14	0.14	0.14	0.16	0.18	0.18	0.14	0.11	0.12	0.12	0.12	0.10
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.06	0.04	0.02	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	0.08	0.01	0.08	0.02	0.03
SrO	0.03	0.01	0.06	0.11	0.07	0.01	0.04	0.06	0.02	0.07	0.05	0.08	0.03
Total	100.50	100.95	100.52	100.17	100.03	100.46	100.41	100.93	100.91	100.79	100.98	100.31	100.80
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.81	2.81	2.74	2.82	2.84	2.85	2.82	2.80	2.79	2.83	2.71	2.73	2.74
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.20	1.21	1.28	1.20	1.17	1.17	1.18	1.21	1.22	1.18	1.29	1.28	1.26
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.17	0.18	0.24	0.16	0.13	0.14	0.15	0.18	0.19	0.17	0.27	0.26	0.25
Na	0.81	0.80	0.74	0.79	0.83	0.83	0.85	0.79	0.80	0.81	0.72	0.72	0.73
K	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	4.98	5.00	4.99	5.02	5.00	5.01	4.99	5.01	5.00	5.00

Mineral							Plagioclase						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Plg 16.1	Plg 16.2	Plg 16.3	Plg 16.4	Plg 16.5	Plg 16.6	Plg 16.7	Plg 16.8	Plg 16.9	Plg 16.10	Plg 16.11	Plg 16.12	Plg 16.13
SiO_2	63.89	63.95	62.67	63.80	62.99	62.31	62.90	62.87	61.88	62.32	62.29	60.85	60.41
TiO_2	0.02	*n.d.*	0.08	0.01	0.05	0.04	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	*n.d.*
Al_2O_3	23.04	23.17	23.91	23.03	23.88	23.82	23.89	23.90	24.77	24.33	24.26	25.19	25.42
Fe*	0.07	0.16	0.12	0.10	0.17	0.09	0.17	0.13	0.11	0.20	0.12	0.11	0.15
MnO	0.01	*n.d.*	0.01	*n.d.*	0.03	*n.d.*	*n.d.*	0.01	0.02	0.01	*n.d.*	0.01	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	3.47	3.49	4.23	3.51	4.23	4.52	4.42	4.39	5.25	4.78	4.79	5.94	6.18
Na_2O	9.50	9.60	8.89	9.72	9.31	9.01	9.08	9.10	8.61	8.68	8.77	8.05	8.11
K_2O	0.12	0.13	0.10	0.13	0.15	0.13	0.13	0.11	0.12	0.12	0.13	0.07	0.08
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.06	*n.d.*	*n.d.*	*n.d.*	0.03	0.03	0.04	0.04	*n.d.*	0.04	*n.d.*	*n.d.*
SrO	0.05	0.06	0.05	0.06	0.03	0.05	0.07	0.10	0.09	0.06	0.05	0.13	0.04
Total	100.19	100.62	100.06	100.36	100.84	100.00	100.69	100.65	100.88	100.50	100.50	100.35	100.39
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.82	2.81	2.77	2.81	2.77	2.76	2.77	2.77	2.73	2.75	2.75	2.70	2.68
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.20	1.20	1.25	1.20	1.24	1.24	1.24	1.24	1.29	1.26	1.26	1.32	1.33
Fe^{2+}	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.16	0.16	0.20	0.17	0.20	0.21	0.21	0.21	0.25	0.23	0.23	0.28	0.29
Na	0.81	0.82	0.76	0.83	0.79	0.77	0.78	0.78	0.74	0.74	0.75	0.69	0.70
K	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.01	4.99	5.02	5.02	5.01	5.01	5.01	5.01	5.00	5.00	5.00	5.01

Mineral	Plagioclase												
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Plg 17.1	Plg 17.2	Plg 17.3	Plg 17.4	Plg 17.5	Plg 17.6	Plg 17.7	Plg 17.8	Plg 17.9	Plg 17.10	Plg 1.12	Plg 1.14	Plg 1.15
SiO_2	61.75	62.82	61.48	61.07	62.35	62.71	62.39	63.66	63.80	61.16	64.34	64.24	61.44
TiO_2	*n.d.*	0.04	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	0.02	0.02
Al_2O_3	24.21	23.85	24.48	24.65	24.37	24.07	24.20	23.28	23.61	24.24	23.56	23.58	25.27
Fe*	0.24	0.14	0.09	0.07	0.16	0.11	0.15	0.08	0.07	0.58	0.05	0.05	0.11
MnO	*n.d.*	*n.d.*	0.01	0.01	0.01	*n.d.*	0.01	*n.d.*	0.01	*n.d.*	*n.d.*	0.02	0.01
MgO	0.06	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.51	*n.d.*	*n.d.*	*n.d.*
CaO	5.20	4.30	5.19	5.58	4.63	4.66	4.77	3.74	3.86	6.26	4.04	4.14	5.89
Na_2O	8.41	9.06	8.57	8.45	9.03	8.99	8.74	9.36	9.19	7.93	9.14	9.00	8.41
K_2O	0.12	0.14	0.14	0.14	0.15	0.11	0.15	0.19	0.10	0.09	0.18	0.21	0.18
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.07	*n.d.*	*n.d.*	0.06	0.05	*n.d.*	0.06	0.01	*n.d.*	0.08	0.04	*n.d.*	*n.d.*
SrO	0.06	0.09	0.04	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.05	0.08	0.07
Total	100.13	100.44	100.00	100.09	100.82	100.70	100.53	100.38	100.68	100.90	101.41	101.33	101.40
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.74	2.77	2.73	2.71	2.75	2.76	2.75	2.80	2.80	2.71	2.80	2.80	2.70
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.27	1.24	1.28	1.29	1.26	1.25	1.26	1.21	1.22	1.26	1.21	1.21	1.31
Fe^{2+}	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
Ca	0.25	0.20	0.25	0.27	0.22	0.22	0.23	0.18	0.18	0.30	0.19	0.19	0.28
Na	0.72	0.77	0.74	0.73	0.77	0.77	0.75	0.80	0.78	0.68	0.77	0.76	0.72
K	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.01	5.01	5.02	5.01	5.00	5.00	4.99	5.01	4.99	4.98	5.02

Mineral							Plagioclase						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Plg 1.17	Plg 1.18	Plg 2.3	Plg 2.9	Plg 2.13	Plg 2.14	Plg 2.16	Plg 2.17	Plg 2.18	Plg 2.19	Plg 3.1	Plg 3.2	Plg 3.3
SiO_2	61.93	61.91	61.91	60.88	51.82	62.85	62.95	55.44	61.02	63.50	62.52	61.93	63.77
TiO_2	*n.d.*	0.02	0.03	*n.d.*	0.14	*n.d.*	*n.d.*	0.07	*n.d.*	*n.d.*	0.02	*n.d.*	0.05
Al_2O_3	24.70	25.08	25.19	25.81	3.13	24.34	24.41	14.03	26.01	23.91	24.79	24.95	23.96
Fe*	0.01	*n.d.*	0.16	0.12	10.24	0.08	0.13	4.25	0.05	0.12	0.02	0.02	0.02
MnO	*n.d.*	0.01	*n.d.*	0.01	0.09	*n.d.*	0.01	0.05	*n.d.*	*n.d.*	0.01	0.03	0.01
MgO	*n.d.*	*n.d.*	0.01	*n.d.*	12.28	*n.d.*	*n.d.*	6.22	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	5.26	5.70	5.74	6.51	21.89	4.82	4.98	14.55	6.62	4.48	5.29	5.70	4.34
Na_2O	8.57	8.26	8.16	7.74	0.84	8.52	8.69	4.52	7.59	9.00	8.45	8.43	8.88
K_2O	0.17	0.15	0.20	0.16	0.03	0.16	0.19	0.06	0.14	0.20	0.20	0.19	0.20
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.01	*n.d.*	0.04	0.06	*n.d.*	0.07	0.01	0.03	*n.d.*	0.02	*n.d.*	*n.d.*	0.06
SrO	0.08	0.07	0.06	0.13	*n.d.*	0.08	0.05	0.01	0.04	0.10	0.07	0.03	0.05
Total	100.73	101.20	101.50	101.42	100.46	100.93	101.42	99.24	101.47	101.33	101.37	101.29	101.34
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.73	2.72	2.71	2.68	2.58	2.76	2.75	2.63	2.67	2.78	2.74	2.72	2.78
Ti	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.28	1.30	1.30	1.34	0.18	1.26	1.26	0.78	1.34	1.23	1.28	1.29	1.23
Fe^{2+}	0.00	0.00	0.01	0.00	0.43	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00
Ca	0.25	0.27	0.27	0.31	1.17	0.23	0.23	0.74	0.31	0.21	0.25	0.27	0.20
Na	0.73	0.70	0.69	0.66	0.08	0.73	0.74	0.42	0.65	0.76	0.72	0.72	0.75
K	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.01	5.00	4.99	5.00	5.37	4.98	5.00	5.19	4.99	5.00	4.99	5.01	4.99

Mineral							Plagioclase						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Plg 3.4	Plg 3.6	Plg 3.7	Plg 3.8	Plg 3.9	Plg 3.10	Plg 3.11	Plg 3.12	Plg 3.14	Plg 3.16	Plg 3.17	Plg 3.18	Plg 3.20
SiO_2	62.44	63.87	62.05	63.40	64.21	61.36	63.32	62.59	61.34	61.64	65.28	64.36	64.26
TiO_2	*n.d.*	0.05	0.02	*n.d.*	*n.d.*	*n.d.*	0.04	0.08	0.03	*n.d.*	0.01	0.02	0.01
Al_2O_3	24.51	23.86	24.98	23.78	23.32	25.43	23.94	24.81	25.28	25.45	22.83	23.51	23.61
Fe*	0.03	0.04	0.06	0.05	0.01	0.03	0.04	0.03	0.19	0.01	0.06	0.04	0.01
MnO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	5.25	4.18	5.63	4.56	3.84	6.15	4.49	5.25	5.93	5.95	3.28	3.86	3.94
Na_2O	8.31	9.00	8.36	8.92	9.21	7.99	8.87	8.36	8.10	8.04	9.69	9.26	9.30
K_2O	0.19	0.18	0.16	0.28	0.20	0.21	0.20	0.20	0.22	0.19	0.24	0.22	0.21
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.04	*n.d.*	0.02	*n.d.*	0.05	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	0.03
SrO	0.07	0.10	0.04	0.03	0.05	0.07	0.06	0.10	0.05	0.04	0.03	0.03	0.08
Total	100.84	101.28	101.32	101.02	100.90	101.26	100.96	101.41	101.14	101.33	101.43	101.32	101.44
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.75	2.79	2.72	2.78	2.81	2.70	2.78	2.74	2.70	2.70	2.84	2.81	2.80
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.27	1.23	1.29	1.23	1.20	1.32	1.24	1.28	1.31	1.32	1.17	1.21	1.21
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.25	0.20	0.26	0.21	0.18	0.29	0.21	0.25	0.28	0.28	0.15	0.18	0.18
Na	0.71	0.76	0.71	0.76	0.78	0.68	0.75	0.71	0.69	0.68	0.82	0.78	0.79
K	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.99	4.99	5.00	5.00	4.99	5.00	4.99	4.99	5.00	4.99	5.00	4.99	5.00

Mineral							Plagioclase						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Plg 3.21	Plg 4.2	Plg 4.4	Plg 4.5	Plg 4.8	Plg 4.9	Plg 4.13	Plg 4.15	Plg 4.16	Plg 5.2	Plg 5.4	Plg 5.6	Plg 5.7
SiO_2	65.12	62.89	61.87	54.60	63.87	62.75	63.29	64.34	62.65	60.32	61.28	60.21	60.22
TiO_2	0.03	*n.d.*	*n.d.*	0.11	0.08	*n.d.*	*n.d.*	0.01	0.04	0.03	*n.d.*	*n.d.*	0.07
Al_2O_3	23.12	24.41	24.89	10.72	23.86	24.55	24.12	23.40	24.49	25.69	25.62	26.33	26.08
Fe*	*n.d.*	0.09	0.15	6.74	0.08	0.11	0.10	0.02	0.13	0.54	0.13	0.17	0.21
MnO	*n.d.*	0.01	*n.d.*	0.06	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01
MgO	*n.d.*	*n.d.*	*n.d.*	7.41	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	3.47	5.08	5.71	15.47	4.31	5.06	4.77	3.92	5.27	6.57	6.30	7.04	6.89
Na_2O	9.34	8.71	8.23	3.46	9.01	8.68	8.63	9.13	8.55	7.72	7.84	7.53	7.43
K_2O	0.26	0.16	0.09	0.06	0.21	0.21	0.22	0.19	0.20	0.11	0.11	0.11	0.16
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.02	*n.d.*	0.04	0.05	*n.d.*	0.01	0.06	0.02	0.09	*n.d.*	*n.d.*	0.02	*n.d.*
SrO	0.06	0.09	0.11	*n.d.*	0.04	0.05	0.06	0.05	0.02	0.08	0.06	0.06	0.08
Total	101.41	101.44	101.10	98.69	101.46	101.42	101.25	101.09	101.45	101.07	101.34	101.47	101.14
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.83	2.75	2.72	2.65	2.78	2.75	2.77	2.81	2.74	2.67	2.69	2.65	2.66
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.18	1.26	1.29	0.61	1.23	1.27	1.24	1.20	1.26	1.34	1.33	1.36	1.36
Fe^{2+}	0.00	0.00	0.01	0.27	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.16	0.24	0.27	0.80	0.20	0.24	0.22	0.18	0.25	0.31	0.30	0.33	0.33
Na	0.79	0.74	0.70	0.33	0.76	0.74	0.73	0.77	0.73	0.66	0.67	0.64	0.64
K	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.98	5.00	4.99	5.21	4.99	5.00	4.99	4.98	5.00	5.00	4.99	5.00	4.99

Mineral							Plagioclase						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Plg 5.8	Plg 5.9	Plg 5.10	Plg 5.11	Plg 5.12	Plg 6.2	Plg 6.3	Plg 6.4	Plg 6.6	Plg 6.7	Plg 6.8	Plg 6.10	Plg 6.11
SiO_2	59.91	60.01	59.83	60.50	60.10	62.42	62.96	63.64	61.03	62.16	62.19	64.38	64.01
TiO_2	0.05	0.02	0.03	*n.d.*	0.03	0.02	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*
Al_2O_3	25.86	26.20	25.81	25.43	26.10	24.68	24.15	23.88	25.06	24.75	23.92	23.10	23.15
Fe*	0.36	0.19	0.18	0.11	0.18	0.06	0.02	0.05	0.11	0.05	0.06	0.07	0.04
MnO	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	6.70	7.04	6.93	6.37	6.64	5.56	4.52	4.47	5.63	5.38	5.06	3.59	3.68
Na_2O	7.58	7.48	7.67	7.92	7.61	8.37	8.87	8.85	7.96	8.47	8.45	9.32	9.54
K_2O	0.08	0.15	0.16	0.17	0.26	0.20	0.17	0.28	0.35	0.23	0.25	0.28	0.22
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.05	*n.d.*	*n.d.*	*n.d.*	0.07	0.02	0.02	0.02	0.02	*n.d.*	*n.d.*	0.01	*n.d.*
SrO	0.03	0.10	0.10	0.03	0.07	0.06	0.09	0.02	0.08	0.05	0.07	0.08	0.05
Total	100.63	101.18	100.73	100.53	101.07	101.40	100.80	101.22	100.27	101.12	100.00	100.82	100.69
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.66	2.65	2.65	2.68	2.65	2.73	2.77	2.78	2.71	2.73	2.76	2.82	2.81
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.35	1.36	1.35	1.33	1.36	1.27	1.25	1.23	1.31	1.28	1.25	1.19	1.20
Fe^{2+}	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.32	0.33	0.33	0.30	0.31	0.26	0.21	0.21	0.27	0.25	0.24	0.17	0.17
Na	0.65	0.64	0.66	0.68	0.65	0.71	0.76	0.75	0.68	0.72	0.73	0.79	0.81
K	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.01	5.01	5.00	5.00	5.00	4.99	5.00	5.00	4.99	4.99	5.01

Mineral							Plagioclase						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Plg 6.12	Plg 6.13	Plg 6.14	Plg 6.15	Plg 6.16	Plg 6.17	Plg 6.18	Plg 7.1	Plg 7.3	Plg 7.5	Plg 8.6	Plg 8.7	Plg 8.10
SiO_2	63.00	64.06	63.82	62.61	63.98	64.63	64.26	62.41	64.34	64.54	61.49	62.35	60.87
TiO_2	0.04	0.03	0.02	0.02	*n.d.*	0.03	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*
Al_2O_3	23.81	22.94	23.20	24.36	23.55	23.23	23.29	24.57	23.56	23.24	25.09	24.56	25.66
Fe*	0.03	0.01	0.07	0.07	0.08	0.02	0.06	0.20	0.05	0.04	0.25	0.15	0.21
MnO	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	4.45	3.76	3.75	5.10	4.11	3.63	3.76	5.18	3.88	3.72	5.49	5.24	6.44
Na_2O	8.89	9.38	9.31	8.84	9.10	9.32	9.43	8.80	9.21	9.36	8.18	8.59	7.91
K_2O	0.14	0.26	0.29	0.24	0.24	0.22	0.26	0.18	0.26	0.19	0.13	0.13	0.15
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	*n.d.*	0.08	0.05	*n.d.*	*n.d.*	0.06	*n.d.*	0.11	0.08	*n.d.*	*n.d.*	0.05
SrO	0.04	0.05	0.04	0.08	0.07	0.08	0.07	0.02	0.05	0.03	0.01	0.02	0.07
Total	100.42	100.49	100.58	101.36	101.12	101.15	101.20	101.37	101.49	101.20	100.67	101.05	101.36
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.78	2.82	2.81	2.74	2.80	2.82	2.81	2.74	2.80	2.82	2.71	2.74	2.68
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.24	1.19	1.20	1.26	1.21	1.19	1.20	1.27	1.21	1.20	1.30	1.27	1.33
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.21	0.18	0.18	0.24	0.19	0.17	0.18	0.24	0.18	0.17	0.26	0.25	0.30
Na	0.76	0.80	0.79	0.75	0.77	0.79	0.80	0.75	0.78	0.79	0.70	0.73	0.67
K	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.99	5.00	5.00	5.01	4.99	4.99	5.00	5.01	4.99	4.99	4.99	5.00	5.00

Mineral							Plagioclase						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Plg 9.1	Plg 9.3	Plg 9.4	Plg 9.5	Plg 9.6	Plg 9.7	Plg 9.9	Plg 9.13	Plg 9.14	Plg 9.16	Plg 10.2	Plg 10.3	Plg 10.4
SiO_2	59.75	61.12	61.61	60.80	52.18	59.74	62.15	63.01	62.41	62.57	61.76	61.49	61.54
TiO_2	0.06	0.04	0.01	0.02	0.08	0.07	*n.d.*	0.01	0.02	0.01	0.02	*n.d.*	0.01
Al_2O_3	24.72	25.24	24.74	25.10	4.51	20.24	24.37	24.46	24.38	24.60	24.99	25.26	25.20
Fe*	1.35	0.43	0.13	0.16	8.64	2.24	0.16	0.15	0.10	0.21	*n.d.*	0.12	0.04
MnO	0.02	*n.d.*	*n.d.*	*n.d.*	0.12	0.04	0.01	*n.d.*	*n.d.*	0.01	0.01	*n.d.*	*n.d.*
MgO	0.65	*n.d.*	*n.d.*	*n.d.*	11.75	2.67	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*
CaO	6.63	5.99	5.64	6.05	20.72	9.37	5.61	4.98	5.16	5.25	5.68	5.84	6.01
Na_2O	7.40	7.87	8.07	8.01	1.36	6.83	8.46	8.50	8.58	8.51	8.08	8.13	8.23
K_2O	0.13	0.13	0.17	0.16	0.01	0.13	0.15	0.19	0.17	0.18	0.13	0.14	0.18
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.04	*n.d.*	0.05	*n.d.*	*n.d.*	*n.d.*	0.02	0.05	*n.d.*	0.01	0.04	*n.d.*
SrO	0.06	0.01	*n.d.*	0.01	*n.d.*	0.07	0.06	0.03	0.07	0.07	0.06	0.12	0.02
Total	100.78	100.87	100.37	100.37	99.39	101.40	100.97	101.37	100.95	101.42	100.73	101.14	101.23
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.66	2.70	2.72	2.70	2.60	2.69	2.74	2.75	2.74	2.74	2.72	2.70	2.70
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.30	1.31	1.29	1.31	0.26	1.07	1.26	1.26	1.26	1.27	1.30	1.31	1.30
Fe^{2+}	0.05	0.02	0.00	0.01	0.36	0.08	0.01	0.01	0.00	0.01	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.04	0.00	0.00	0.00	0.87	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.32	0.28	0.27	0.29	1.11	0.45	0.26	0.23	0.24	0.25	0.27	0.28	0.28
Na	0.64	0.67	0.69	0.69	0.13	0.60	0.72	0.72	0.73	0.72	0.69	0.69	0.70
K	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.02	4.99	4.99	5.00	5.34	5.08	5.00	4.99	5.00	5.00	4.98	5.00	5.00

Mineral							Plagioclase						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Plg 10.5	Plg 10.6	Plg 10.7	Plg 11.1	Plg 11.2	Plg 11.3	Plg 11.4	Plg 11.5	Plg 11.6	Plg 11.7	Plg 11.8	Plg 11.10	Plg 11.11
SiO_2	61.01	63.58	63.64	61.23	61.34	60.98	61.44	60.40	63.80	62.29	60.89	61.99	63.49
TiO_2	*n.d.*	0.07	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.06	0.05	*n.d.*	*n.d.*	*n.d.*
Al_2O_3	25.36	23.73	23.60	25.28	25.18	25.47	24.86	25.29	23.58	24.27	24.98	24.60	23.63
Fe*	0.09	0.11	0.08	0.27	0.39	0.22	0.16	0.30	0.18	0.13	0.24	0.22	0.16
MnO	0.01	*n.d.*	0.02	0.02	0.04	0.01	0.01	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	6.22	4.21	4.18	6.18	5.79	6.17	5.83	6.29	4.15	5.11	5.72	5.33	4.40
Na_2O	7.94	9.06	8.94	8.06	8.15	8.05	8.36	7.91	9.29	8.50	8.09	8.31	9.00
K_2O	0.20	0.26	0.20	0.08	0.08	0.09	0.09	0.13	0.09	0.08	0.14	0.12	0.13
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.03	*n.d.*	0.04	0.05	*n.d.*	0.08	0.17	*n.d.*	0.07	0.09	*n.d.*	0.02	*n.d.*
SrO	0.09	0.05	0.06	0.04	0.05	0.03	0.06	0.09	0.01	*n.d.*	0.01	0.09	0.03
Total	100.95	101.06	100.78	101.21	101.02	101.11	100.98	100.43	101.25	100.53	100.06	100.68	100.84
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.69	2.78	2.79	2.69	2.70	2.69	2.71	2.68	2.79	2.75	2.71	2.73	2.79
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.32	1.22	1.22	1.31	1.31	1.32	1.29	1.32	1.22	1.26	1.31	1.28	1.22
Fe^{2+}	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.29	0.20	0.20	0.29	0.27	0.29	0.28	0.30	0.19	0.24	0.27	0.25	0.21
Na	0.68	0.77	0.76	0.69	0.70	0.69	0.72	0.68	0.79	0.73	0.70	0.71	0.77
K	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	4.99	5.00	5.00	5.00	5.01	5.01	5.00	4.99	5.00	4.99	4.99

Mineral							Plagioclase						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Plg 11.13	Plg 11.14	Plg 11.15	Plg 11.16	Plg 11.17	Plg 11.18	Plg 11.19	Plg 11.22	Plg 11.23	Plg 11.26	Plg 11.27	Plg 11.28	Plg 12.1
SiO_2	62.07	61.47	61.15	61.01	61.98	62.11	61.73	52.37	58.80	62.51	62.91	62.10	64.83
TiO_2	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.03	0.04	*n.d.*	*n.d.*	*n.d.*	0.04
Al_2O_3	24.74	24.83	24.51	25.26	24.80	24.66	24.96	3.94	17.86	24.56	24.39	24.72	23.10
Fe*	0.15	0.20	0.24	0.21	0.25	0.29	0.18	8.22	4.27	0.20	0.18	0.18	0.13
MnO	*n.d.*	0.01	0.02	0.01	0.01	*n.d.*	*n.d.*	0.10	0.03	*n.d.*	0.01	*n.d.*	0.01
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	11.63	3.15	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	5.50	5.75	5.67	5.97	5.59	5.39	5.58	21.34	8.46	5.16	5.12	5.46	3.53
Na_2O	8.44	8.21	8.26	8.16	8.32	8.41	8.44	1.02	6.43	8.46	8.60	8.54	9.24
K_2O	0.17	0.17	0.14	0.14	0.19	0.12	0.18	*n.d.*	0.11	0.15	0.20	0.18	0.43
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.11	0.04	0.02	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	0.03	*n.d.*	0.05	0.08	*n.d.*
SrO	0.02	0.03	0.06	0.06	0.03	0.03	0.05	*n.d.*	0.02	0.05	0.04	*n.d.*	0.09
Total	101.20	100.72	100.08	100.82	101.18	101.01	101.13	98.65	99.21	101.09	101.50	101.27	101.41
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.73	2.71	2.72	2.69	2.72	2.73	2.71	2.62	2.72	2.74	2.75	2.73	2.82
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.28	1.29	1.28	1.31	1.28	1.28	1.29	0.23	0.97	1.27	1.26	1.28	1.19
Fe^{2+}	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.34	0.17	0.01	0.01	0.01	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.22	0.00	0.00	0.00	0.00
Ca	0.26	0.27	0.27	0.28	0.26	0.25	0.26	1.14	0.42	0.24	0.24	0.26	0.16
Na	0.72	0.70	0.71	0.70	0.71	0.72	0.72	0.10	0.58	0.72	0.73	0.73	0.78
K	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.02
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	5.01	5.00	5.00	5.01	5.32	5.09	4.99	5.00	5.01	4.99

Mineral							Plagioclase						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Plg 12.2	Plg 12.3	Plg 12.5	Plg 13.1	Plg 13.2	Plg 13.3	Plg 13.4	Plg 13.5	Plg 13.6	Plg 13.8	Plg 13.9	Plg 13.10	Plg 13.11
SiO_2	65.19	63.21	63.10	62.36	63.79	64.38	61.80	60.48	43.57	61.58	63.70	63.46	63.15
TiO_2	*n.d.*	0.04	*n.d.*	0.04	0.06	0.04	*n.d.*	0.01	1.18	*n.d.*	*n.d.*	*n.d.*	0.03
Al_2O_3	22.95	24.20	24.39	24.76	23.86	23.03	25.02	26.42	13.96	25.38	23.89	24.11	23.88
Fe*	0.03	0.07	0.08	0.05	*n.d.*	*n.d.*	0.03	0.03	14.60	0.06	0.07	0.06	0.15
MnO	*n.d.*	0.01	*n.d.*	0.01	*n.d.*	*n.d.*	0.01	0.02	0.07	*n.d.*	0.02	0.02	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	11.35	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	3.34	4.85	4.97	5.26	4.47	3.61	5.87	6.09	11.76	6.11	4.33	4.61	4.57
Na_2O	9.35	8.55	8.43	8.33	8.85	9.24	8.08	7.76	1.87	8.03	9.09	8.82	8.71
K_2O	0.46	0.36	0.35	0.20	0.27	0.23	0.18	0.13	0.96	0.21	0.25	0.26	0.24
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.05	0.01	0.02	0.04	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	0.06	0.03	0.08
SrO	0.10	0.10	0.07	0.06	0.01	0.10	0.08	0.09	*n.d.*	0.06	0.09	0.06	0.06
Total	101.47	101.39	101.41	101.10	101.32	100.64	101.08	101.02	99.33	101.44	101.49	101.42	100.88
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.84	2.76	2.76	2.74	2.78	2.82	2.72	2.66	2.21	2.70	2.78	2.77	2.77
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
Al	1.18	1.25	1.26	1.28	1.23	1.19	1.30	1.37	0.83	1.31	1.23	1.24	1.24
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.00	0.00	0.00
Ca	0.16	0.23	0.23	0.25	0.21	0.17	0.28	0.29	0.64	0.29	0.20	0.22	0.22
Na	0.79	0.72	0.71	0.71	0.75	0.79	0.69	0.66	0.18	0.68	0.77	0.75	0.74
K	0.03	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.06	0.01	0.01	0.01	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.99	4.99	4.99	4.99	4.99	4.99	4.99	4.99	5.46	5.00	5.00	4.99	4.99

Mineral							Plagioclase						
Sample	SPF 01C1	SPF 01C1	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Plg 13.12	Plg 13.13	Plg 1.1	Plg 1.2	Plg 1.3	Plg 1.4	Plg 1.6	Plg 1.8	Plg 1.9	Plg 1.10	Plg 1.11	Plg 1.15	Plg 1.16
SiO_2	62.54	62.09	62.88	63.69	63.44	64.12	63.04	62.36	62.28	62.72	64.02	62.94	62.68
TiO_2	0.02	0.05	*n.d.*	0.03	*n.d.*	0.02	*n.d.*	0.06	0.04	0.01	*n.d.*	0.03	0.02
Al_2O_3	24.42	24.59	23.39	22.67	23.41	23.19	23.76	23.89	23.79	23.94	23.15	23.65	23.46
Fe*	0.15	0.25	0.09	0.10	0.07	0.10	0.11	0.13	0.16	0.13	0.06	0.10	0.08
MnO	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
MgO	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	5.07	5.66	4.19	3.64	4.16	3.75	4.53	4.59	4.90	4.71	3.81	4.45	4.29
Na_2O	8.58	8.48	9.05	9.52	9.09	9.30	9.16	8.79	8.88	9.07	9.46	8.83	9.08
K_2O	0.21	0.24	0.11	0.02	0.10	0.08	0.08	0.07	0.08	0.07	0.07	0.08	0.10
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.03	0.05	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.07	*n.d.*	0.04	0.05	*n.d.*
SrO	0.10	0.04	0.15	0.16	0.14	0.10	0.11	0.15	0.16	0.16	0.10	0.16	0.25
Total	101.12	101.47	99.88	99.83	100.41	100.69	100.79	100.03	100.40	100.80	100.70	100.29	99.96
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.75	2.72	2.79	2.82	2.79	2.81	2.77	2.76	2.76	2.76	2.81	2.78	2.78
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.26	1.27	1.22	1.18	1.22	1.20	1.23	1.25	1.24	1.24	1.20	1.23	1.23
Fe^{2+}	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.24	0.27	0.20	0.17	0.20	0.18	0.21	0.22	0.23	0.22	0.18	0.21	0.20
Na	0.73	0.72	0.78	0.82	0.78	0.79	0.78	0.75	0.76	0.77	0.81	0.76	0.78
K	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total	5.00	5.01	5.00	5.00	4.99	4.99	5.01	5.00	5.01	5.01	5.00	4.99	5.01

Mineral							Plagioclase						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Plg 1.17	Plg 1.18	Plg 1.19	Plg 1.20	Plg 5.2	Plg 5.3	Plg 5.4	Plg 5.5	Plg 5.6	Plg 5.7	Plg 5.8	Plg 5.9	Plg 5.10
SiO_2	61.49	61.03	63.28	63.66	61.04	61.50	63.02	62.28	55.45	56.83	62.23	61.87	62.76
TiO_2	0.07	*n.d.*	0.04	0.09	0.01	0.02	*n.d.*	*n.d.*	0.15	0.12	0.02	0.03	*n.d.*
Al_2O_3	24.42	24.90	23.10	23.32	24.39	24.35	23.15	24.03	9.41	13.36	24.07	24.59	24.09
Fe*	0.29	0.07	0.09	0.16	0.17	0.19	0.19	0.13	5.15	3.63	0.19	0.19	0.17
MnO	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.05	0.03	0.02	*n.d.*	0.01
MgO	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.13	*n.d.*	9.60	6.84	*n.d.*	*n.d.*	*n.d.*
CaO	5.46	5.58	3.96	4.09	5.07	4.87	3.96	4.63	17.43	14.02	4.57	4.77	4.60
Na_2O	8.36	8.27	9.20	9.18	8.58	8.65	9.25	8.93	3.22	4.93	8.96	8.75	8.93
K_2O	0.08	0.06	0.07	0.07	0.05	0.04	0.07	0.07	*n.d.*	0.12	0.09	0.07	0.09
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.01	0.04	*n.d.*	*n.d.*	*n.d.*	0.05	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	0.05
SrO	0.24	0.17	0.12	0.10	0.11	0.17	0.18	0.14	0.08	0.10	0.17	0.14	0.13
Total	100.41	100.10	99.91	100.67	99.43	99.79	100.00	100.23	100.53	100.00	100.31	100.41	100.84
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.73	2.71	2.80	2.80	2.73	2.74	2.79	2.76	2.64	2.67	2.75	2.73	2.76
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Al	1.28	1.30	1.21	1.21	1.28	1.28	1.21	1.25	0.53	0.74	1.26	1.28	1.25
Fe^{2+}	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.20	0.14	0.01	0.01	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.68	0.48	0.00	0.00	0.00
Ca	0.26	0.27	0.19	0.19	0.24	0.23	0.19	0.22	0.89	0.70	0.22	0.23	0.22
Na	0.72	0.71	0.79	0.78	0.74	0.75	0.79	0.77	0.30	0.45	0.77	0.75	0.76
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	4.99	5.01	5.01	5.01	5.01	5.25	5.19	5.01	5.01	5.00

Mineral							Plagioclase						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Plg 5.11	Plg 6.1	Plg 6.2	Plg 6.3	Plg 6.4	Plg 6.5	Plg 8.1	Plg 8.2	Plg 8.3	Plg 8.4	Plg 8.5	Plg 8.6	Plg 8.7
SiO_2	62.25	62.93	62.87	63.32	63.34	63.19	62.38	62.15	61.58	61.57	61.18	61.34	61.33
TiO_2	0.07	0.03	*n.d.*	*n.d.*	0.07	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	0.02
Al_2O_3	24.00	23.51	23.50	23.63	23.34	23.29	23.86	24.28	24.95	24.71	24.75	24.64	24.93
Fe*	0.20	0.13	0.06	0.19	0.11	0.13	0.21	0.32	0.12	0.15	0.15	0.12	0.09
MnO	0.01	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	4.48	3.99	3.66	3.97	3.67	3.83	4.49	4.68	5.37	5.20	5.32	5.27	5.35
Na_2O	8.94	9.27	9.40	9.26	9.42	9.32	9.06	8.70	8.55	8.53	8.46	8.45	8.40
K_2O	0.05	0.04	0.06	0.07	0.15	0.08	0.11	0.02	0.02	0.06	0.06	0.05	0.04
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.07	0.03	*n.d.*	0.06	*n.d.*	*n.d.*	0.02	*n.d.*	0.03	*n.d.*	*n.d.*	*n.d.*
SrO	0.16	0.11	0.09	0.11	0.09	0.06	0.10	0.12	0.17	0.12	0.10	0.17	0.11
Total	100.16	100.07	99.67	100.55	100.27	99.92	100.22	100.29	100.76	100.38	100.01	100.04	100.28
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.76	2.78	2.79	2.79	2.80	2.80	2.76	2.75	2.72	2.72	2.72	2.72	2.72
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.25	1.23	1.23	1.23	1.21	1.21	1.24	1.27	1.30	1.29	1.30	1.29	1.30
Fe^{2+}	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.21	0.19	0.17	0.19	0.17	0.18	0.21	0.22	0.25	0.25	0.25	0.25	0.25
Na	0.77	0.80	0.81	0.79	0.81	0.80	0.78	0.75	0.73	0.73	0.73	0.73	0.72
K	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.01	5.01	5.01	5.00	5.01	5.00	5.01	5.00	5.01	5.00	5.01	5.00	5.00

Mineral							Plagioclase						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Plg 8.8	Plg 8.9	Plg 8.10	Plg 8.11	Plg 8.12	Plg 8.13	Plg 8.14	Plg 9.1	Plg 9.2	Plg 9.3	Plg 9.4	Plg 9.5	Plg 9.6
SiO_2	60.16	59.60	61.85	60.65	60.13	62.14	59.42	61.64	62.97	61.64	60.63	60.44	62.45
TiO_2	0.01	0.06	*n.d.*	0.06	0.07	0.03	*n.d.*	0.03	0.04	*n.d.*	*n.d.*	*n.d.*	*n.d.*
Al_2O_3	25.90	25.84	24.56	25.43	25.80	24.73	26.25	24.98	24.20	24.42	25.31	25.50	24.10
Fe*	0.21	0.20	0.20	0.16	0.15	0.12	0.15	0.28	0.14	0.18	0.31	0.27	0.14
MnO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	0.01
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.03	*n.d.*
CaO	6.43	6.41	5.20	6.02	6.43	5.12	7.05	5.45	4.39	4.82	5.92	6.08	4.38
Na_2O	7.90	8.00	8.62	8.19	7.92	8.60	7.64	8.55	8.94	8.79	8.11	8.10	9.09
K_2O	0.02	0.11	0.06	0.08	0.06	0.04	0.06	0.06	0.10	0.07	0.05	0.05	0.07
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.01	0.04	0.01	*n.d.*	0.05	0.01	0.06	0.02	0.09	0.02	*n.d.*	0.02
SrO	0.07	0.14	0.11	0.15	0.13	0.10	0.17	0.18	0.07	0.11	0.13	0.13	0.13
Total	100.71	100.37	100.65	100.75	100.71	100.93	100.75	101.22	100.88	100.13	100.48	100.60	100.38
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.66	2.65	2.73	2.68	2.66	2.73	2.64	2.71	2.76	2.73	2.69	2.68	2.76
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.35	1.36	1.28	1.33	1.35	1.28	1.37	1.29	1.25	1.28	1.32	1.33	1.25
Fe^{2+}	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.30	0.31	0.25	0.29	0.31	0.24	0.34	0.26	0.21	0.23	0.28	0.29	0.21
Na	0.68	0.69	0.74	0.70	0.68	0.73	0.66	0.73	0.76	0.76	0.70	0.70	0.78
K	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.01	5.02	5.01	5.01	5.01	5.00	5.01	5.01	5.00	5.01	5.01	5.01	5.01

Mineral							Plagioclase						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Plg 10.1	Plg 10.2	Plg 10.3	Plg 10.4	Plg 10.5	Plg 10.6	Plg 10.7	Plg 10.8	Plg 10.9	Plg 1.5	Plg 1.6	Plg 2.2	Plg 2.3
SiO_2	62.73	63.10	62.94	62.81	63.04	63.26	62.90	62.66	63.14	64.60	64.81	64.91	65.24
TiO_2	0.01	0.05	0.01	0.02	0.03	0.03	*n.d.*	0.03	0.04	0.01	0.02	0.03	*n.d.*
Al_2O_3	24.16	23.86	23.58	23.87	24.01	23.52	23.98	24.05	23.85	22.74	22.75	22.29	22.78
Fe*	0.17	0.11	0.16	0.19	0.13	0.13	0.20	0.18	0.18	0.17	0.12	0.12	0.19
MnO	0.01	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	0.01	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	0.02	0.02	*n.d.*
CaO	4.38	4.22	3.97	4.24	4.34	3.93	4.40	4.49	4.24	3.47	3.26	2.64	3.05
Na_2O	8.90	9.14	9.12	9.08	9.24	9.21	9.14	8.86	9.11	9.62	9.73	9.91	9.85
K_2O	0.13	0.05	0.05	0.10	0.04	0.07	0.09	0.07	0.10	0.08	0.08	0.04	0.09
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.05	0.05	*n.d.*	*n.d.*	*n.d.*	0.02	0.05	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.05
SrO	0.09	0.17	0.05	0.15	0.13	0.09	0.05	0.10	0.09	0.08	0.07	0.03	0.03
Total	100.57	100.75	99.94	100.48	100.96	100.26	100.81	100.49	100.76	100.78	100.86	100.00	101.28
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.76	2.77	2.79	2.77	2.77	2.79	2.77	2.76	2.78	2.83	2.84	2.86	2.84
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.25	1.24	1.23	1.24	1.24	1.22	1.24	1.25	1.24	1.17	1.17	1.16	1.17
Fe^{2+}	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.21	0.20	0.19	0.20	0.20	0.19	0.21	0.21	0.20	0.16	0.15	0.12	0.14
Na	0.76	0.78	0.78	0.78	0.79	0.79	0.78	0.76	0.78	0.82	0.83	0.85	0.83
K	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	5.01	5.01	5.00	5.01	5.00	5.00	5.00	5.00	4.99	5.00

Mineral							Plagioclase						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Plg 2.3a	Plg 2.4	Plg 2.5	Plg 2.6	Plg 2.7	Plg 2.8	Plg 2.9	Plg 2.9a	Plg 2.10	Plg 2.10a	Plg 3.4	Plg 3.8	Plg 4.1
SiO_2	64.35	64.16	64.62	64.20	65.10	65.08	65.08	65.26	65.45	64.94	64.42	65.22	65.14
TiO_2	0.04	*n.d.*	0.03	0.04	*n.d.*	*n.d.*	0.07	*n.d.*	0.05	*n.d.*	0.07	0.02	0.01
Al_2O_3	22.75	22.64	22.82	22.90	22.29	22.47	22.68	22.42	22.12	22.54	23.21	22.69	22.44
Fe*	0.12	0.17	0.11	0.14	0.12	0.07	0.14	0.10	0.15	0.20	0.11	0.09	0.25
MnO	*n.d.*	0.01	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	0.03	*n.d.*	*n.d.*	0.02
CaO	3.59	3.08	3.12	3.26	2.59	2.78	2.84	2.90	2.37	2.91	3.48	3.18	3.08
Na_2O	9.50	9.57	9.83	9.65	9.95	9.85	9.89	9.81	10.06	10.12	9.46	9.71	9.72
K_2O	0.02	0.07	0.04	0.07	0.07	0.05	0.05	0.06	0.03	0.06	0.06	*n.d.*	0.07
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.04	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.02	0.02	*n.d.*	0.01
SrO	0.07	0.01	0.03	0.10	0.06	0.06	0.12	0.04	0.06	0.07	0.08	0.07	0.06
Total	100.47	99.71	100.61	100.35	100.20	100.38	100.88	100.59	100.30	100.88	100.92	100.97	100.80
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.83	2.84	2.83	2.82	2.86	2.85	2.84	2.86	2.87	2.84	2.82	2.85	2.85
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.18	1.18	1.18	1.19	1.15	1.16	1.17	1.16	1.14	1.16	1.20	1.17	1.16
Fe^{2+}	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.17	0.15	0.15	0.15	0.12	0.13	0.13	0.14	0.11	0.14	0.16	0.15	0.14
Na	0.81	0.82	0.84	0.82	0.85	0.84	0.84	0.83	0.86	0.86	0.80	0.82	0.82
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.99	4.99	5.00	5.00	4.99	4.99	5.00	4.99	4.99	5.01	4.99	4.99	4.99

Mineral							Plagioclase						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Plg 4.2	Plg 4.3	Plg 4.4	Plg 4.5	Plg 4.6	Plg 4.7	Plg 4.8	Plg 4.9	Plg 4.10	Plg 5.1	Plg 5.1a	Plg 5.2	Plg 5.3
SiO_2	64.23	64.79	64.83	64.39	64.21	64.38	63.64	63.92	62.24	63.30	65.14	61.99	63.08
TiO_2	*n.d.*	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	0.10	*n.d.*	*n.d.*	0.05
Al_2O_3	23.01	22.88	22.82	22.92	23.05	23.04	23.25	23.23	24.48	23.50	22.75	24.45	23.77
Fe*	0.23	0.18	0.18	0.19	0.17	0.09	0.17	0.08	0.05	0.17	0.07	0.25	0.05
MnO	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01
CaO	3.61	3.07	3.16	3.31	3.20	3.42	3.62	3.55	4.95	4.10	3.08	5.12	4.13
Na_2O	9.56	9.74	9.73	9.64	9.77	9.61	9.39	9.40	8.56	9.38	9.67	8.62	9.21
K_2O	0.05	0.05	0.07	0.01	0.03	0.06	0.11	0.04	0.03	0.07	0.03	0.03	0.04
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	0.04	0.08	0.03	0.04	*n.d.*	0.03	*n.d.*	*n.d.*
SrO	0.08	0.08	0.04	0.08	0.02	0.11	0.04	0.07	0.05	0.07	0.07	0.06	0.06
Total	100.77	100.80	100.84	100.59	100.45	100.76	100.31	100.32	100.41	100.69	100.83	100.53	100.41
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.82	2.83	2.84	2.83	2.82	2.82	2.80	2.81	2.75	2.78	2.85	2.74	2.78
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.19	1.18	1.18	1.19	1.19	1.19	1.21	1.20	1.27	1.22	1.17	1.27	1.23
Fe^{2+}	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.17	0.14	0.15	0.16	0.15	0.16	0.17	0.17	0.23	0.19	0.14	0.24	0.19
Na	0.81	0.83	0.83	0.82	0.83	0.82	0.80	0.80	0.73	0.80	0.82	0.74	0.79
K	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	5.00	5.01	5.00	5.00	4.99	4.99	5.01	4.99	5.00	5.00

Mineral							Plagioclase						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Plg 5.4	Plg 5.5	Plg 5.6	Plg 5.6a	Plg 5.7	Plg 6.1	Plg 6.2	Plg 6.3	Plg 6.3a	Plg 6.4	Plg 6.5	Plg 6.6	Plg 6.7
SiO_2	63.28	60.74	64.30	63.73	63.42	62.69	63.94	64.28	62.49	63.40	61.31	60.44	63.03
TiO_2	0.01	0.02	0.03	*n.d.*	*n.d.*	*n.d.*	0.02	0.10	0.01	0.02	0.09	*n.d.*	*n.d.*
Al_2O_3	23.49	24.09	23.18	23.68	23.45	24.40	23.24	22.88	24.36	23.37	21.87	24.91	24.32
Fe*	0.14	0.04	0.11	0.02	0.19	0.13	0.07	0.04	0.10	0.05	2.16	0.24	0.16
MnO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	1.33	*n.d.*	*n.d.*
CaO	3.87	4.94	3.48	4.17	3.76	4.63	3.50	3.10	4.94	3.73	4.65	5.51	4.61
Na_2O	9.30	8.39	9.44	9.22	9.36	8.81	9.66	9.74	8.53	9.45	8.21	7.97	8.83
K_2O	0.05	0.05	0.05	0.07	0.03	0.02	0.03	0.06	0.06	0.04	0.10	0.06	0.04
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	0.04	0.08	0.01	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	0.01	0.03	0.04
SrO	0.06	0.15	0.09	0.05	0.01	0.05	0.02	0.10	0.10	0.05	0.08	0.08	0.09
Total	100.19	98.47	100.76	100.95	100.24	100.73	100.50	100.30	100.58	100.12	99.81	99.25	101.11
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.79	2.74	2.82	2.79	2.80	2.76	2.81	2.83	2.75	2.80	2.75	2.71	2.76
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.22	1.28	1.20	1.22	1.22	1.26	1.20	1.19	1.26	1.22	1.16	1.31	1.26
Fe^{2+}	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.08	0.01	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
Ca	0.18	0.24	0.16	0.20	0.18	0.22	0.16	0.15	0.23	0.18	0.22	0.26	0.22
Na	0.80	0.73	0.80	0.78	0.80	0.75	0.82	0.83	0.73	0.81	0.71	0.69	0.75
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	4.99	5.00	5.00	4.99	5.01	5.00	4.99	5.00	5.03	4.99	4.99

Mineral							Plagioclase						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Plg 6.7a	Plg 6.8	Plg 6.9	Plg 6.10	Plg 6.11	Plg 6.12	Plg 7.4	Plg 7.5	Plg 7.7	Plg 7.8	Plg 8.1	Plg 8.2	Plg 8.2a
SiO_2	64.19	61.71	64.32	61.74	63.27	63.37	61.17	64.80	64.85	65.11	64.54	61.82	62.99
TiO_2	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.03	*n.d.*	*n.d.*
Al_2O_3	23.50	24.74	23.09	23.40	23.53	23.84	17.48	22.19	22.67	22.26	22.86	24.81	23.73
Fe*	0.09	0.10	0.10	0.33	0.13	0.18	2.53	0.12	0.13	0.12	0.19	0.17	0.09
MnO	*n.d.*	*n.d.*	0.01	0.01	*n.d.*	0.01	0.01	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	0.22	0.01	*n.d.*	2.82	*n.d.*	0.01	0.01	*n.d.*	*n.d.*	*n.d.*
CaO	3.93	5.16	3.30	4.30	3.94	3.86	7.50	3.03	3.23	2.80	3.15	5.14	4.58
Na_2O	9.15	8.55	9.47	8.93	9.18	9.39	7.98	9.56	9.73	9.99	9.63	8.58	8.99
K_2O	0.02	0.04	0.06	0.06	0.05	0.06	0.05	0.09	0.07	0.04	0.07	0.03	0.03
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.07	0.01	0.04	*n.d.*	0.02	*n.d.*	0.01	0.02
SrO	0.06	0.07	0.03	0.05	0.07	0.05	0.06	0.06	0.06	0.09	0.02	0.12	0.06
Total	100.94	100.36	100.39	99.03	100.17	100.82	99.61	99.90	100.76	100.45	100.49	100.68	100.50
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.81	2.73	2.82	2.76	2.79	2.78	2.79	2.86	2.84	2.86	2.83	2.73	2.78
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.21	1.29	1.19	1.23	1.22	1.23	0.94	1.15	1.17	1.15	1.18	1.29	1.23
Fe^{2+}	0.00	0.00	0.00	0.01	0.00	0.01	0.10	0.00	0.00	0.00	0.01	0.01	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.01	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.18	0.24	0.16	0.21	0.19	0.18	0.37	0.14	0.15	0.13	0.15	0.24	0.22
Na	0.78	0.73	0.81	0.78	0.79	0.80	0.71	0.82	0.83	0.85	0.82	0.73	0.77
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.98	5.00	4.99	5.01	5.00	5.01	5.10	4.98	5.00	5.00	4.99	5.00	5.00

Mineral							Plagioclase						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Plg 8.3	Plg 8.3a	Plg 8.4	Plg 8.5	Plg 8.6	Plg 8.7	Plg 8.7a	Plg 8.8	Plg 8.8a	Plg 8.9	Plg 8.10	Plg 8.10a	Plg 8.11
SiO_2	63.62	61.82	63.44	61.97	64.99	62.40	64.79	65.04	65.33	63.77	65.22	55.96	64.71
TiO_2	*n.d.*	0.04	0.01	*n.d.*	0.04	0.01	0.03	0.02	*n.d.*	*n.d.*	0.02	0.16	*n.d.*
Al_2O_3	23.72	24.53	23.80	24.64	23.04	24.41	22.61	22.65	22.50	23.56	22.75	10.10	22.65
Fe*	0.08	0.20	0.26	0.15	0.17	0.53	0.19	0.11	0.16	0.10	0.11	6.98	0.06
MnO	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.08	0.01
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	7.80	*n.d.*
CaO	4.29	5.14	4.20	5.11	3.24	4.97	3.21	2.83	2.86	3.78	2.79	15.43	3.00
Na_2O	9.13	8.48	9.19	8.42	9.54	8.83	9.94	9.95	9.96	9.33	10.09	4.18	9.92
K_2O	0.05	0.05	0.07	0.06	0.05	0.04	0.03	0.03	0.07	0.03	0.06	0.05	0.04
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.05	0.03	0.01	*n.d.*	*n.d.*	0.05	0.03	0.03	0.04	0.04	*n.d.*	0.04	0.02
SrO	0.03	0.14	0.12	0.06	0.08	0.05	0.09	0.10	0.06	0.06	0.05	0.02	0.06
Total	100.96	100.44	101.11	100.41	101.15	101.30	100.93	100.75	100.98	100.68	101.09	100.80	100.46
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.79	2.73	2.78	2.74	2.83	2.74	2.84	2.85	2.85	2.80	2.84	2.66	2.84
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Al	1.22	1.28	1.23	1.28	1.18	1.26	1.17	1.17	1.16	1.22	1.17	0.57	1.17
Fe^{2+}	0.00	0.01	0.01	0.01	0.01	0.02	0.01	0.00	0.01	0.00	0.00	0.28	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00
Ca	0.20	0.24	0.20	0.24	0.15	0.23	0.15	0.13	0.13	0.18	0.13	0.79	0.14
Na	0.78	0.73	0.78	0.72	0.81	0.75	0.84	0.84	0.84	0.79	0.85	0.39	0.84
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.00	4.99	4.99	5.01	5.01	5.00	5.00	5.00	5.01	5.25	5.00

Mineral							Plagioclase						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Plg 8.12	Plg 8.13	Plg 8.14	Plg 8.15	Plg 8.16	Plg 8.17	Plg 9.1	Plg 9.2	Plg 9.3	Plg 9.3a	Plg 9.4	Plg 9.5	Plg 9.6
SiO_2	64.34	62.04	63.40	62.56	63.33	63.28	64.40	57.83	64.14	65.94	62.96	62.41	64.93
TiO_2	0.07	*n.d.*	0.03	*n.d.*	0.04	0.08	0.06	0.02	0.03	*n.d.*	0.02	0.01	*n.d.*
Al_2O_3	23.37	24.54	23.82	24.03	23.43	23.48	23.06	13.57	23.08	22.18	23.35	24.31	22.40
Fe*	0.23	0.17	0.14	0.07	0.05	0.11	0.15	5.45	0.20	0.05	0.20	0.15	0.14
MnO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.06	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	5.28	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	3.61	4.96	4.18	4.60	3.82	3.96	3.38	11.93	3.40	2.53	4.04	4.57	2.51
Na_2O	9.40	8.85	9.09	9.00	9.27	9.46	9.48	6.01	9.64	10.17	9.26	8.91	10.24
K_2O	0.02	0.02	0.03	0.05	0.03	0.05	0.02	0.04	0.04	0.03	0.05	0.02	0.03
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.01	*n.d.*	*n.d.*	*n.d.*	0.04	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	0.03	0.04
SrO	0.10	0.09	0.05	0.07	0.10	0.08	0.06	0.07	0.08	0.06	0.12	0.03	0.07
Total	101.16	100.68	100.74	100.37	100.11	100.50	100.62	100.26	100.62	100.96	100.01	100.45	100.35
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.81	2.74	2.78	2.76	2.80	2.79	2.82	2.71	2.82	2.87	2.79	2.75	2.85
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.20	1.28	1.23	1.25	1.22	1.22	1.19	0.75	1.19	1.14	1.22	1.26	1.16
Fe^{2+}	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.21	0.01	0.00	0.01	0.01	0.01
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00
Ca	0.17	0.23	0.20	0.22	0.18	0.19	0.16	0.60	0.16	0.12	0.19	0.22	0.12
Na	0.80	0.76	0.77	0.77	0.79	0.81	0.81	0.55	0.82	0.86	0.79	0.76	0.87
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.99	5.01	4.99	5.01	5.00	5.01	4.99	5.19	5.00	4.99	5.01	5.00	5.01

Mineral							Plagioclase						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Plg 9.7	Plg 9.8	Plg 9.9	Plg 9.10	Plg 9.11	Plg 9.12	Plg 9.13	Plg 9.14	Plg 9.15	Plg 10.8	Plg 11.7	Plg 11.9	Plg 11.10
SiO_2	64.97	65.71	65.62	65.10	64.34	65.13	61.44	64.15	64.61	65.01	65.98	64.22	62.50
TiO_2	*n.d.*	*n.d.*	*n.d.*	0.05	0.01	*n.d.*	0.02	0.03	0.01	*n.d.*	*n.d.*	0.01	*n.d.*
Al_2O_3	22.75	22.08	22.18	22.43	22.89	22.44	24.52	22.93	22.49	22.72	22.06	23.01	24.41
Fe*	0.10	0.01	0.05	0.12	0.11	0.10	0.15	0.18	0.15	0.14	0.12	0.11	0.09
MnO	*n.d.*	0.01	*n.d.*	0.01	*n.d.*	*n.d.*	0.02	0.02	*n.d.*	0.02	*n.d.*	0.01	0.01
MgO	0.02	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	2.98	2.28	2.44	2.64	3.03	2.76	5.04	3.38	2.80	3.01	2.29	3.46	5.04
Na_2O	9.85	10.27	10.47	10.16	9.86	10.00	8.49	9.58	9.96	9.93	10.31	9.51	8.58
K_2O	0.04	0.03	0.02	0.07	0.02	0.05	*n.d.*	0.05	0.07	0.02	0.04	0.06	0.05
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.06	0.06	0.04	0.05	0.03	*n.d.*	0.01	*n.d.*	0.02
SrO	0.04	0.05	0.05	0.06	0.03	0.02	0.12	0.08	0.05	0.08	0.05	0.10	0.13
Total	100.75	100.44	100.84	100.64	100.35	100.56	99.83	100.45	100.18	100.93	100.87	100.49	100.84
Oxygens	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Si	2.84	2.88	2.87	2.85	2.83	2.85	2.73	2.82	2.84	2.84	2.88	2.82	2.75
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.17	1.14	1.14	1.16	1.19	1.16	1.28	1.19	1.17	1.17	1.13	1.19	1.26
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.14	0.11	0.11	0.12	0.14	0.13	0.24	0.16	0.13	0.14	0.11	0.16	0.24
Na	0.84	0.87	0.89	0.86	0.84	0.85	0.73	0.82	0.85	0.84	0.87	0.81	0.73
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	5.00	5.01	5.01	5.00	5.00	5.00	5.00	5.01	5.00	5.00	5.00	4.99

Mineral	Plagioclase	Garnet											
Sample	SPF 03B	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Plg 11.11	Grt 1.1	Grt 1.2	Grt 1.3	Grt 1.4	Grt 1.5	Grt 1.6	Grt 2.1	Grt 2.2	Grt 2.3	Grt 2.4	Grt 2.5	Grt 2.6
SiO_2	63.91	38.68	38.82	38.51	38.69	38.53	38.64	38.94	38.82	38.85	38.53	38.69	38.63
TiO_2	*n.d.*	0.06	0.07	0.25	0.23	0.17	0.05	0.06	0.33	0.29	0.24	0.26	0.04
Al_2O_3	23.38	21.63	21.62	21.57	21.58	21.73	21.95	22.24	21.46	21.54	21.54	21.60	22.05
Fe*	0.07	23.64	22.77	21.93	22.05	22.19	23.52	22.25	21.89	22.86	22.32	22.14	21.70
MnO	*n.d.*	1.13	0.75	0.70	0.66	0.72	0.69	0.88	0.63	0.58	0.61	0.66	0.88
MgO	*n.d.*	2.85	3.67	3.58	3.43	3.63	4.06	3.29	3.28	3.34	3.40	3.44	3.34
CaO	3.90	13.29	13.12	13.94	13.96	13.70	12.19	14.00	14.39	13.63	14.08	14.04	13.93
Na_2O	9.36	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	0.05	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.a.*	0.11	0.13	0.11	0.08	0.08	0.03	0.09	0.11	0.11	0.06	0.05	0.13
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	0.04	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	0.11	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.82	101.39	100.95	100.59	100.68	100.74	101.13	101.75	100.91	101.19	100.78	100.88	100.70
Oxygens	8.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.80	2.99	3.00	2.98	2.99	2.98	2.97	2.98	3.00	3.00	2.98	2.99	2.98
Ti	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.02	0.02	0.01	0.02	0.00
Al	1.21	1.97	1.97	1.97	1.97	1.98	1.99	2.01	1.95	1.96	1.96	1.97	2.01
Fe^{2+}	0.00	1.48	1.43	1.37	1.40	1.38	1.45	1.39	1.40	1.46	1.39	1.39	1.38
Mn	0.00	0.07	0.05	0.05	0.04	0.05	0.05	0.06	0.04	0.04	0.04	0.04	0.06
Mg	0.00	0.33	0.42	0.41	0.40	0.42	0.47	0.38	0.38	0.38	0.39	0.40	0.38
Ca	0.18	1.10	1.08	1.16	1.16	1.13	1.01	1.15	1.19	1.13	1.17	1.16	1.15
Na	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01
Fe^{3+}	0.00	0.05	0.04	0.05	0.03	0.06	0.06	0.03	0.02	0.02	0.06	0.04	0.02
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Grt 2.7	Grt 3.2	Grt 3.3	Grt 3.4	Grt 3.5	Grt 3.6	Grt 3.7	Grt 4.1	Grt 4.2	Grt 4.3	Grt 4.4	Grt 4.5	Grt 4.6
SiO_2	38.63	39.11	38.67	38.61	38.88	38.64	38.68	38.78	38.54	38.76	38.58	38.72	38.66
TiO_2	0.11	0.30	0.19	0.21	0.24	0.23	*n.d.*	0.01	0.03	0.23	0.22	0.33	0.20
Al_2O_3	22.14	21.83	21.57	21.58	21.62	21.51	21.85	22.14	22.29	21.64	21.73	21.55	21.54
Fe*	22.78	21.83	22.21	22.15	21.89	22.08	22.75	23.90	23.32	22.37	22.24	21.87	22.39
MnO	0.84	0.77	0.61	0.62	0.70	0.74	0.89	0.37	0.67	0.74	0.71	0.70	0.69
MgO	3.62	3.55	3.38	3.34	3.45	3.54	3.75	3.64	3.92	3.63	3.60	3.48	3.61
CaO	12.81	13.79	13.99	13.88	14.07	14.02	12.87	11.81	12.33	13.48	13.94	14.29	13.90
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.03	0.06	0.06	0.04	0.08	0.13	0.08	0.04	0.03	0.08	0.07	0.07	0.06
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.96	101.24	100.69	100.43	100.93	100.89	100.87	100.69	101.13	100.93	101.09	101.01	101.06
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	3.00	2.99	2.99	3.00	2.98	2.99	3.00	2.97	2.99	2.97	2.98	2.98
Ti	0.01	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.02	0.01
Al	2.01	1.98	1.97	1.97	1.97	1.96	1.99	2.02	2.02	1.97	1.97	1.96	1.96
Fe^{2+}	1.45	1.40	1.40	1.42	1.40	1.37	1.42	1.55	1.45	1.41	1.36	1.37	1.37
Mn	0.06	0.05	0.04	0.04	0.05	0.05	0.06	0.02	0.04	0.05	0.05	0.05	0.05
Mg	0.42	0.41	0.39	0.39	0.40	0.41	0.43	0.42	0.45	0.42	0.41	0.40	0.41
Ca	1.06	1.13	1.16	1.15	1.16	1.16	1.06	0.98	1.02	1.11	1.15	1.18	1.15
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.02	0.00	0.03	0.02	0.01	0.05	0.05	0.00	0.05	0.03	0.07	0.04	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	7.99	8.00	8.00	8.00	8.00	8.00	7.99	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Grt 4.7	Grt 4.8	Grt 5.1	Grt 5.2	Grt 5.3	Grt 5.4	Grt 5.5	Grt 5.6	Grt 5.7	Grt 5.8	Grt 6.1	Grt 6.2	Grt 6.3
SiO_2	38.74	38.82	38.80	38.70	38.81	38.74	38.98	39.02	38.85	38.43	38.89	38.87	38.75
TiO_2	0.20	0.22	0.03	*n.d.*	0.15	0.26	0.05	0.06	0.20	0.26	0.09	0.04	0.09
Al_2O_3	21.70	21.60	22.32	22.17	21.81	21.89	22.10	21.82	21.52	21.50	22.10	22.09	21.80
Fe*	22.50	22.00	23.70	22.42	22.52	22.66	23.43	21.47	22.29	23.65	23.43	22.28	23.32
MnO	0.68	0.75	0.62	0.78	0.72	0.75	0.76	0.69	0.74	1.04	1.05	0.97	1.50
MgO	3.64	3.71	4.07	3.76	3.75	3.87	3.67	3.72	3.77	2.97	3.68	3.75	4.58
CaO	13.68	13.66	11.62	13.03	13.06	12.95	12.54	13.88	13.65	12.75	11.84	13.17	11.10
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.08	0.07	0.03	0.03	0.03	0.10	0.04	0.16	0.09	0.12	0.02	0.05	0.02
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.22	100.83	101.19	100.89	100.84	101.22	101.58	100.82	101.11	100.72	101.10	101.22	101.16
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	2.99	2.98	2.98	2.99	2.98	2.99	3.01	2.99	2.99	3.00	2.99	2.98
Ti	0.01	0.01	0.00	0.00	0.01	0.02	0.00	0.00	0.01	0.02	0.01	0.00	0.01
Al	1.97	1.96	2.02	2.01	1.98	1.98	2.00	1.98	1.95	1.97	2.01	2.00	1.98
Fe^{2+}	1.39	1.39	1.51	1.41	1.44	1.43	1.48	1.38	1.39	1.52	1.51	1.40	1.44
Mn	0.04	0.05	0.04	0.05	0.05	0.05	0.05	0.04	0.05	0.07	0.07	0.06	0.10
Mg	0.42	0.43	0.47	0.43	0.43	0.44	0.42	0.43	0.43	0.34	0.42	0.43	0.53
Ca	1.13	1.13	0.96	1.08	1.08	1.07	1.03	1.15	1.13	1.06	0.98	1.08	0.91
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Fe^{3+}	0.05	0.03	0.01	0.03	0.02	0.03	0.02	0.00	0.05	0.02	0.00	0.03	0.06
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Grt 6.4	Grt 6.5	Grt 6.6	Grt 6.7	Grt 6.8	Grt 6.9	Grt 6.10	Grt 6.11	Grt 6.12	Grt 6.13	Grt 6.14	Grt 6.15	Grt 6.16
SiO_2	38.72	38.88	38.70	38.82	38.78	38.81	38.78	38.78	38.56	38.82	38.85	38.98	38.65
TiO_2	0.07	0.09	0.11	0.08	0.06	0.06	0.08	0.08	0.19	0.15	0.07	0.07	0.07
Al_2O_3	21.76	21.85	21.88	21.88	22.22	21.90	21.81	21.81	21.68	21.66	21.66	21.83	21.97
Fe*	23.14	23.20	23.02	23.06	22.08	23.33	23.54	23.39	23.14	22.92	23.27	22.97	23.10
MnO	1.46	1.05	0.90	1.14	0.88	1.37	0.94	1.02	0.90	0.91	1.04	1.04	1.43
MgO	4.47	4.44	4.44	4.45	3.55	4.56	4.41	4.36	4.30	4.24	4.39	4.33	4.45
CaO	11.28	11.51	11.36	11.57	13.39	11.08	11.26	11.39	11.91	11.91	11.41	11.59	11.55
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.04	0.03	0.16	0.03	0.03	0.03	0.05	*n.d.*	0.10	0.20	0.31	0.14	0.05
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.94	101.05	100.57	101.03	100.98	101.14	100.88	100.83	100.78	100.82	101.00	100.95	101.27
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	2.99	2.99	2.99	2.99	2.98	2.99	2.99	2.98	3.00	2.99	3.00	2.97
Ti	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
Al	1.98	1.98	1.99	1.98	2.02	1.98	1.98	1.98	1.97	1.97	1.97	1.98	1.99
Fe^{2+}	1.44	1.46	1.48	1.44	1.41	1.45	1.49	1.48	1.44	1.46	1.48	1.48	1.41
Mn	0.10	0.07	0.06	0.07	0.06	0.09	0.06	0.07	0.06	0.06	0.07	0.07	0.09
Mg	0.51	0.51	0.51	0.51	0.41	0.52	0.51	0.50	0.49	0.49	0.50	0.50	0.51
Ca	0.93	0.95	0.94	0.95	1.10	0.91	0.93	0.94	0.99	0.98	0.94	0.96	0.95
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.00
Fe^{3+}	0.05	0.03	0.01	0.04	0.01	0.05	0.03	0.03	0.05	0.02	0.02	0.00	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 6.17	Grt 6.18	Grt 6.19	Grt 7.1	Grt 7.2	Grt 7.3	Grt 7.4	Grt 7.5	Grt 7.6	Grt 1.1	Grt 1.2	Grt 1.3	Grt 1.4
SiO_2	39.08	38.68	38.55	39.15	38.99	38.87	38.85	38.93	38.38	38.65	38.92	38.94	38.76
TiO_2	0.08	0.02	0.04	0.07	0.08	0.11	0.15	0.11	0.03	0.13	0.10	0.01	0.09
Al_2O_3	22.08	22.21	22.11	22.16	22.08	22.13	21.97	21.98	21.92	21.95	21.98	22.18	21.93
Fe*	23.60	23.14	23.86	24.01	23.58	23.33	23.77	23.46	24.69	22.83	22.93	21.60	24.41
MnO	1.11	1.21	0.42	1.20	0.86	0.59	0.53	0.53	1.00	0.72	1.06	1.05	0.30
MgO	4.61	2.60	4.43	3.61	4.12	3.93	3.87	4.34	4.05	3.70	4.13	3.62	4.06
CaO	10.99	14.02	11.37	11.20	11.31	12.10	12.15	11.86	10.71	12.37	12.14	13.61	11.40
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	0.03	0.05	0.07	0.01	0.06	0.03	0.02	0.01	0.05	0.03	0.03	0.02
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.55	101.91	100.83	101.47	101.03	101.13	101.33	101.23	100.79	100.39	101.29	101.03	100.97
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.99	2.97	2.97	3.01	3.00	2.99	2.99	2.99	2.97	3.00	2.99	2.99	2.99
Ti	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01
Al	1.99	2.01	2.01	2.01	2.00	2.01	1.99	1.99	2.00	2.01	1.99	2.01	2.00
Fe^{2+}	1.49	1.43	1.49	1.54	1.52	1.50	1.51	1.48	1.54	1.48	1.44	1.38	1.56
Mn	0.07	0.08	0.03	0.08	0.06	0.04	0.03	0.03	0.07	0.05	0.07	0.07	0.02
Mg	0.53	0.30	0.51	0.41	0.47	0.45	0.44	0.50	0.47	0.43	0.47	0.41	0.47
Ca	0.90	1.15	0.94	0.92	0.93	1.00	1.00	0.98	0.89	1.03	1.00	1.12	0.94
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.02	0.05	0.05	0.00	0.00	0.00	0.02	0.03	0.06	0.00	0.03	0.01	0.02
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	7.98	7.99	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 1.5	Grt 1.6	Grt 1.7	Grt 1.8	Grt 1.9	Grt 1.10	Grt 1.11	Grt 1.12	Grt 1.13	Grt 1.14	Grt 1.15	Grt 1.16	Grt 1.17
SiO_2	38.74	38.81	39.03	38.46	38.85	38.63	38.62	38.62	38.83	38.79	38.79	38.61	38.98
TiO_2	0.05	0.10	0.11	0.09	0.25	0.23	0.27	0.26	0.31	0.17	0.24	0.21	0.13
Al_2O_3	21.99	21.82	21.71	21.77	21.82	21.65	21.81	21.60	21.78	21.71	21.86	21.69	21.81
Fe*	22.32	22.44	22.02	22.52	22.63	22.46	22.65	22.38	22.02	22.21	22.44	22.52	22.32
MnO	1.13	1.18	1.30	1.06	1.11	1.05	1.07	1.05	1.05	1.10	1.14	1.08	1.18
MgO	4.14	4.00	3.83	3.43	3.34	3.14	3.14	3.15	3.50	3.42	3.45	3.43	3.81
CaO	12.71	12.45	12.99	13.35	13.42	13.79	13.40	13.78	13.47	13.57	13.60	13.27	13.29
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	*n.d.*	0.03	0.01	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	0.03	0.06
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.07	100.80	101.02	100.70	101.42	100.96	100.98	100.85	100.96	100.97	101.52	100.84	101.58
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	2.99	3.01	2.98	2.99	2.99	2.99	2.99	3.00	2.99	2.98	2.99	2.99
Ti	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Al	1.99	1.98	1.97	1.99	1.98	1.97	1.99	1.97	1.98	1.97	1.98	1.98	1.97
Fe^{2+}	1.38	1.42	1.41	1.40	1.43	1.42	1.45	1.42	1.42	1.41	1.40	1.42	1.38
Mn	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08
Mg	0.47	0.46	0.44	0.40	0.38	0.36	0.36	0.36	0.40	0.39	0.39	0.40	0.44
Ca	1.05	1.03	1.07	1.11	1.11	1.14	1.11	1.14	1.11	1.12	1.12	1.10	1.09
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.06	0.02	0.01	0.06	0.02	0.03	0.01	0.03	0.00	0.03	0.05	0.03	0.05
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 1.18	Grt 1.19	Grt 1.20	Grt 1.21	Grt 1.22	Grt 1.23	Grt 1.24	Grt 1.25	Grt 1.26	Grt 1.27	Grt 1.28	Grt 1.29	Grt 1.30
SiO_2	38.76	38.93	39.21	38.82	39.16	38.71	38.45	38.67	38.68	38.61	38.29	38.76	38.34
TiO_2	0.10	0.04	0.04	0.10	0.11	0.08	0.19	0.17	0.22	0.29	0.25	0.31	0.29
Al_2O_3	21.87	22.08	22.50	22.20	22.04	21.81	21.71	21.84	21.66	21.56	21.63	21.62	21.46
Fe*	22.16	22.84	23.73	23.13	22.15	22.36	22.68	22.50	22.73	22.19	21.73	21.93	21.94
MnO	1.19	1.03	0.60	0.97	1.15	1.31	1.07	1.05	1.09	1.22	1.34	1.41	1.41
MgO	4.13	3.34	5.07	3.55	4.11	3.47	3.44	3.25	2.98	3.01	3.08	2.90	2.83
CaO	12.90	13.19	10.39	12.41	12.60	13.05	13.18	13.35	13.34	13.79	13.58	13.98	14.25
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.06	0.01	*n.d.*	0.03	*n.d.*	*n.d.*	0.03	*n.d.*	0.02	0.02	*n.d.*	*n.d.*	0.03
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.16	101.47	101.55	101.20	101.32	100.79	100.75	100.83	100.72	100.68	99.90	100.92	100.56
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	2.99	2.99	2.99	3.00	2.99	2.98	2.99	3.00	3.00	2.99	3.00	2.98
Ti	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.02	0.01	0.02	0.02
Al	1.98	2.00	2.02	2.02	1.99	1.99	1.98	1.99	1.98	1.97	1.99	1.97	1.97
Fe^{2+}	1.36	1.45	1.51	1.49	1.42	1.42	1.42	1.44	1.48	1.43	1.41	1.42	1.38
Mn	0.08	0.07	0.04	0.06	0.07	0.09	0.07	0.07	0.07	0.08	0.09	0.09	0.09
Mg	0.47	0.38	0.58	0.41	0.47	0.40	0.40	0.37	0.34	0.35	0.36	0.33	0.33
Ca	1.06	1.09	0.85	1.02	1.04	1.08	1.09	1.11	1.11	1.15	1.14	1.16	1.19
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.06	0.02	0.00	0.00	0.00	0.02	0.05	0.01	0.00	0.01	0.01	0.00	0.05
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 1.31	Grt 1.32	Grt 1.33	Grt 1.34	Grt 2.1	Grt 2.2	Grt 2.3	Grt 2.5	Grt 2.6	Grt 2.7	Grt 2.8	Grt 2.9	Grt 2.10
SiO_2	38.40	38.34	38.56	38.62	38.68	37.94	38.81	38.30	38.99	38.40	38.73	38.38	38.13
TiO_2	0.33	0.20	0.25	0.04	0.12	0.28	0.02	0.19	0.03	0.08	0.05	0.08	0.05
Al_2O_3	21.55	21.63	21.58	21.72	21.74	21.64	22.10	21.64	22.11	21.65	21.70	21.99	22.10
Fe*	22.06	22.20	22.17	22.65	22.84	21.98	21.62	22.33	22.15	22.62	22.66	21.45	23.20
MnO	1.55	1.62	1.59	1.34	1.33	1.40	1.43	1.31	1.24	1.40	1.27	1.17	0.98
MgO	2.70	2.79	2.89	3.69	3.64	3.36	3.23	3.54	4.06	3.59	4.11	3.89	4.26
CaO	14.36	14.04	13.91	12.81	12.60	13.07	13.82	13.21	12.36	12.82	12.37	13.01	11.57
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.03	0.03	0.01	0.01	0.02	*n.d.*	*n.d.*	0.02	0.02	0.02	0.06	0.10	0.07
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.97	100.85	100.96	100.88	100.97	99.67	101.03	100.55	100.96	100.58	100.95	100.06	100.36
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	2.97	2.99	2.98	2.99	2.97	2.99	2.97	3.00	2.98	2.99	2.98	2.95
Ti	0.02	0.01	0.01	0.00	0.01	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Al	1.97	1.98	1.97	1.98	1.98	2.00	2.01	1.98	2.01	1.98	1.97	2.01	2.02
Fe^{2+}	1.38	1.38	1.40	1.40	1.44	1.40	1.38	1.38	1.43	1.40	1.40	1.36	1.43
Mn	0.10	0.11	0.10	0.09	0.09	0.09	0.09	0.09	0.08	0.09	0.08	0.08	0.06
Mg	0.31	0.32	0.33	0.42	0.42	0.39	0.37	0.41	0.47	0.41	0.47	0.45	0.49
Ca	1.19	1.17	1.15	1.06	1.04	1.10	1.14	1.10	1.02	1.06	1.02	1.08	0.96
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Fe^{3+}	0.05	0.06	0.04	0.06	0.04	0.04	0.02	0.07	0.00	0.07	0.06	0.03	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 2.11	Grt 2.12	Grt 2.13	Grt 2.14	Grt 2.15	Grt 2.16	Grt 2.17	Grt 2.18	Grt 2.19	Grt 2.20	Grt 2.21	Grt 2.22	Grt 2.23
SiO_2	38.01	39.14	38.83	38.49	38.29	37.95	37.46	38.93	38.42	38.40	38.13	38.74	38.59
TiO_2	0.05	0.04	0.06	0.02	*n.d.*	0.13	0.23	0.14	0.26	0.27	0.22	0.25	0.21
Al_2O_3	21.76	22.10	21.92	21.83	22.31	21.50	21.56	21.66	21.69	21.53	21.71	21.70	21.77
Fe*	22.70	21.51	22.62	22.65	22.75	22.45	22.04	22.66	21.29	20.94	21.70	22.33	22.41
MnO	1.22	1.13	1.20	1.25	1.28	1.45	1.63	1.51	2.09	2.51	1.52	1.43	1.42
MgO	4.07	3.85	4.08	4.18	4.05	3.95	3.73	3.97	3.28	2.94	3.67	3.97	3.88
CaO	12.29	13.09	12.11	12.37	11.83	12.46	12.88	12.48	13.76	14.22	13.18	12.61	12.54
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	0.07	0.09	0.01	0.07	0.01	0.01	0.03	0.04	*n.d.*	0.01	*n.d.*	0.04
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.10	100.93	100.91	100.80	100.58	99.89	99.54	101.38	100.83	100.82	100.14	101.03	100.85
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.95	3.01	2.99	2.97	2.96	2.96	2.93	2.99	2.97	2.98	2.96	2.99	2.98
Ti	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Al	1.99	2.00	1.99	1.98	2.03	1.98	1.99	1.96	1.98	1.97	1.99	1.97	1.98
Fe^{2+}	1.37	1.38	1.44	1.38	1.42	1.36	1.31	1.41	1.32	1.30	1.34	1.40	1.41
Mn	0.08	0.07	0.08	0.08	0.08	0.10	0.11	0.10	0.14	0.16	0.10	0.09	0.09
Mg	0.47	0.44	0.47	0.48	0.47	0.46	0.44	0.45	0.38	0.34	0.43	0.46	0.45
Ca	1.02	1.08	1.00	1.02	0.98	1.04	1.08	1.03	1.14	1.18	1.10	1.04	1.04
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.10	0.00	0.02	0.08	0.05	0.10	0.13	0.05	0.06	0.06	0.07	0.04	0.04
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	7.99	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 2.24	Grt 2.25	Grt 2.26	Grt 2.27	Grt 2.28	Grt 2.29	Grt 2.30	Grt 2.31	Grt 2.32	Grt 2.33	Grt 2.34	Grt 2.35	Grt 2.36
SiO_2	38.35	38.89	38.90	38.99	38.70	38.67	38.71	38.51	38.32	38.16	38.77	38.44	38.55
TiO_2	0.17	0.06	0.13	0.01	0.14	0.05	0.04	0.26	0.25	0.27	0.24	0.28	0.30
Al_2O_3	21.81	22.13	21.54	22.01	21.60	22.25	22.23	21.71	21.66	21.66	21.61	21.54	21.60
Fe*	22.94	23.47	23.57	23.75	23.14	23.73	22.51	22.22	22.21	22.03	22.57	21.86	22.16
MnO	1.44	1.05	1.45	1.52	1.32	0.89	1.31	1.38	1.31	1.29	1.30	1.27	1.29
MgO	3.83	4.44	3.95	3.68	3.83	4.13	3.49	3.44	3.51	3.19	2.86	2.73	2.77
CaO	12.33	10.74	11.41	11.20	12.36	11.32	12.85	13.37	13.22	13.76	14.15	14.41	14.30
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.04	*n.d.*	0.08	0.03	0.02	0.04	0.03	0.03	0.05	0.05	0.03	*n.d.*	0.04
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.92	100.78	101.03	101.19	101.11	101.09	101.17	100.92	100.53	100.41	101.53	100.53	101.01
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.96	3.00	3.01	3.01	2.99	2.98	2.98	2.98	2.97	2.97	2.99	2.99	2.98
Ti	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.02	0.01	0.02	0.01	0.02	0.02
Al	1.99	2.01	1.96	2.00	1.96	2.02	2.02	1.98	1.98	1.98	1.96	1.97	1.97
Fe^{2+}	1.41	1.51	1.51	1.53	1.44	1.51	1.43	1.39	1.39	1.37	1.41	1.39	1.40
Mn	0.09	0.07	0.09	0.10	0.09	0.06	0.09	0.09	0.09	0.08	0.08	0.08	0.08
Mg	0.44	0.51	0.46	0.42	0.44	0.47	0.40	0.40	0.41	0.37	0.33	0.32	0.32
Ca	1.02	0.89	0.94	0.93	1.02	0.93	1.06	1.11	1.10	1.15	1.17	1.20	1.19
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.00	0.01	0.00	0.06	0.02	0.02	0.05	0.05	0.06	0.04	0.03	0.03
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	7.99	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral	Garnet												
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 2.37	Grt 2.38	Grt 2.39	Grt 2.40	Grt 2.41	Grt 2.42	Grt 2.43	Grt 2.44	Grt 2.46	Grt 2.47	Grt 2.48	Grt 2.49	Grt 2.50
SiO_2	38.10	38.68	38.47	39.00	38.95	39.00	38.78	38.69	38.80	38.69	39.05	38.93	38.85
TiO_2	0.19	0.16	0.23	0.14	0.26	0.15	0.19	0.12	0.02	0.12	0.17	0.17	*n.d.*
Al_2O_3	21.68	21.68	21.56	21.68	21.49	21.65	21.66	21.53	22.15	21.44	21.62	21.45	21.84
Fe*	22.38	22.29	22.20	22.00	21.24	21.94	22.30	22.54	22.39	22.99	22.55	22.79	22.99
MnO	1.30	1.24	1.31	1.65	2.04	1.67	1.43	1.42	1.30	1.33	1.26	1.23	1.30
MgO	2.85	2.97	2.97	3.77	3.18	3.75	3.79	3.91	4.06	4.07	4.13	4.14	4.06
CaO	14.12	14.11	13.99	12.91	14.10	12.61	12.74	12.44	12.65	11.81	12.35	12.11	12.57
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.02	0.03	0.05	0.01	*n.d.*	*n.d.*	0.01	0.03	0.01	0.03	0.01	0.02	0.09
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.64	101.17	100.78	101.16	101.26	100.77	100.89	100.68	101.39	100.48	101.14	100.85	101.70
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.96	2.99	2.98	3.00	3.00	3.01	2.99	2.99	2.97	3.00	3.00	3.01	2.97
Ti	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Al	1.98	1.97	1.97	1.97	1.95	1.97	1.97	1.96	2.00	1.96	1.96	1.95	1.97
Fe^{2+}	1.37	1.40	1.39	1.40	1.34	1.42	1.41	1.42	1.38	1.46	1.43	1.45	1.39
Mn	0.09	0.08	0.09	0.11	0.13	0.11	0.09	0.09	0.08	0.09	0.08	0.08	0.08
Mg	0.33	0.34	0.34	0.43	0.37	0.43	0.44	0.45	0.46	0.47	0.47	0.48	0.46
Ca	1.17	1.17	1.16	1.06	1.16	1.04	1.05	1.03	1.04	0.98	1.02	1.00	1.03
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Fe^{3+}	0.08	0.04	0.04	0.02	0.03	0.00	0.03	0.04	0.06	0.03	0.02	0.02	0.09
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 2.51	Grt 2.52	Grt 2.53	Grt 2.54	Grt 2.55	Grt 2.56	Grt 2.57	Grt 2.58	Grt 2.59	Grt 2.60	Grt 2.61	Grt 2.62	Grt 2.63
SiO_2	38.66	38.80	38.80	39.13	38.93	38.63	38.75	38.48	38.83	38.63	38.59	38.55	38.58
TiO_2	0.20	0.24	0.24	0.07	0.24	0.06	0.21	0.19	0.18	0.18	0.19	0.17	0.23
Al_2O_3	21.40	21.66	21.62	21.81	21.63	21.88	21.56	21.46	21.59	21.49	21.58	21.41	21.80
Fe*	23.52	22.30	21.38	22.35	22.78	23.34	21.67	21.95	21.80	22.18	22.07	22.31	22.45
MnO	1.53	1.33	1.36	1.38	1.39	1.40	1.24	1.27	1.27	1.32	1.28	1.25	1.26
MgO	3.26	3.28	2.87	3.17	2.93	3.43	3.33	3.13	2.90	2.82	2.87	3.07	3.08
CaO	12.41	13.31	14.60	13.64	13.00	12.34	13.90	13.99	14.32	14.19	14.31	13.84	13.56
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.03	0.02	*n.d.*	0.01	0.02	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	0.01	0.01
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.01	100.94	100.87	101.56	100.91	101.08	100.66	100.49	100.90	100.81	100.89	100.62	100.96
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	3.00	3.00	3.00	3.01	3.02	2.99	3.00	2.99	3.00	3.00	2.99	2.99	2.98
Ti	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Al	1.96	1.97	1.97	1.98	1.97	1.99	1.97	1.96	1.97	1.96	1.97	1.96	1.99
Fe^{2+}	1.49	1.44	1.38	1.43	1.48	1.47	1.38	1.38	1.40	1.40	1.39	1.40	1.43
Mn	0.10	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.09	0.08	0.08	0.08
Mg	0.38	0.38	0.33	0.36	0.34	0.40	0.38	0.36	0.33	0.33	0.33	0.36	0.36
Ca	1.03	1.10	1.21	1.12	1.08	1.02	1.15	1.16	1.19	1.18	1.19	1.15	1.12
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.03	0.01	0.01	0.01	0.00	0.04	0.02	0.05	0.01	0.03	0.04	0.04	0.03
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	7.99	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral	Garnet												
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 2.64	Grt 2.65	Grt 2.66	Grt 2.67	Grt 2.68	Grt 2.69	Grt 2.70	Grt 2.71	Grt 2.72	Grt 2.73	Grt 2.74	Grt 2.75	Grt 2.76
SiO_2	38.33	38.86	38.64	38.95	38.82	39.22	38.85	39.11	38.66	38.86	38.54	38.63	38.74
TiO_2	0.12	0.15	0.16	0.15	0.14	0.12	0.03	0.21	0.03	0.22	0.29	0.25	0.23
Al_2O_3	21.65	21.68	21.75	21.69	21.71	21.99	21.95	21.67	21.96	21.49	21.65	21.64	21.72
Fe*	22.85	22.50	22.27	22.67	21.73	23.81	23.67	22.07	22.25	21.80	21.54	21.66	21.74
MnO	1.17	0.94	1.05	1.12	1.45	0.31	1.68	1.17	1.21	1.22	1.36	1.39	1.34
MgO	3.11	3.08	3.36	3.51	3.55	4.71	3.65	3.94	3.93	3.74	2.88	2.88	3.41
CaO	13.56	13.53	13.43	13.27	13.64	10.94	11.38	12.83	12.69	13.22	14.72	14.59	13.86
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	*n.d.*	*n.d.*	0.02	0.04	0.07	*n.d.*	0.04	0.01	0.04	0.02	0.03	0.06
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.80	100.75	100.66	101.38	101.08	101.17	101.21	101.04	100.75	100.59	101.01	101.07	101.10
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.97	3.01	2.99	3.00	2.99	3.01	3.00	3.01	2.98	3.01	2.98	2.98	2.99
Ti	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.02	0.01	0.01
Al	1.98	1.98	1.99	1.97	1.97	1.99	2.00	1.97	2.00	1.96	1.97	1.97	1.97
Fe^{2+}	1.41	1.46	1.42	1.43	1.36	1.53	1.52	1.42	1.40	1.40	1.35	1.36	1.37
Mn	0.08	0.06	0.07	0.07	0.09	0.02	0.11	0.08	0.08	0.08	0.09	0.09	0.09
Mg	0.36	0.36	0.39	0.40	0.41	0.54	0.42	0.45	0.45	0.43	0.33	0.33	0.39
Ca	1.13	1.12	1.11	1.09	1.13	0.90	0.94	1.06	1.05	1.10	1.22	1.21	1.14
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.00	0.02	0.03	0.04	0.00	0.01	0.00	0.04	0.01	0.05	0.04	0.04
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	7.99	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 2.77	Grt 2.78	Grt 3.1	Grt 3.2	Grt 3.3	Grt 3.4	Grt 3.5	Grt 3.6	Grt 3.7	Grt 3.8	Grt 3.9	Grt 3.10	Grt 3.11
SiO_2	38.84	38.68	39.40	39.00	38.98	38.84	38.77	38.58	38.51	38.82	38.65	39.13	39.05
TiO_2	0.22	0.06	0.04	0.07	0.03	0.10	0.07	0.06	0.07	0.04	0.02	0.10	0.09
Al_2O_3	21.42	22.04	22.45	22.10	22.06	22.12	22.03	21.91	21.96	22.11	21.92	21.76	21.67
Fe*	21.75	23.20	24.24	24.12	24.04	23.86	24.01	23.13	23.68	22.54	22.09	22.06	21.90
MnO	1.42	0.90	0.22	0.34	0.43	0.65	0.91	1.27	1.32	1.22	1.24	1.34	1.30
MgO	3.35	4.64	4.65	4.21	3.65	3.56	3.07	2.81	2.61	3.54	3.99	3.95	4.02
CaO	13.73	11.09	10.63	11.22	11.79	12.27	12.58	13.40	12.93	12.87	12.80	13.30	12.99
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.10	0.03	0.01	0.01	0.07	0.09	0.03	0.04	0.05	0.03	0.02	0.04	0.06
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.83	100.64	101.64	101.07	101.05	101.49	101.47	101.20	101.13	101.17	100.73	101.69	101.07
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	3.00	2.98	3.01	3.00	3.01	2.99	2.99	2.98	2.99	2.99	2.98	2.99	3.00
Ti	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Al	1.95	2.00	2.02	2.01	2.01	2.01	2.00	2.00	2.01	2.01	1.99	1.96	1.96
Fe^{2+}	1.39	1.47	1.55	1.55	1.55	1.52	1.53	1.46	1.52	1.43	1.38	1.36	1.38
Mn	0.09	0.06	0.01	0.02	0.03	0.04	0.06	0.08	0.09	0.08	0.08	0.09	0.08
Mg	0.39	0.53	0.53	0.48	0.42	0.41	0.35	0.32	0.30	0.41	0.46	0.45	0.46
Ca	1.14	0.92	0.87	0.93	0.97	1.01	1.04	1.11	1.07	1.06	1.06	1.09	1.07
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.02	0.03	0.00	0.00	0.00	0.01	0.02	0.04	0.02	0.02	0.05	0.05	0.03
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	7.99	8.00	7.99	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 3.12	Grt 3.13	Grt 3.14	Grt 3.15	Grt 3.16	Grt 3.17	Grt 3.18	Grt 3.19	Grt 4.1	Grt 4.2	Grt 4.3	Grt 4.4	Grt 4.5
SiO_2	38.98	38.86	38.75	38.73	38.75	38.91	39.02	38.42	39.11	38.67	38.62	38.70	38.69
TiO_2	0.07	0.02	0.09	0.10	0.09	0.09	0.07	0.05	0.11	0.06	0.02	0.17	0.06
Al_2O_3	21.70	21.73	22.05	21.99	22.07	21.94	22.12	22.15	22.42	22.09	22.13	22.04	22.14
Fe*	22.16	22.76	22.58	23.56	24.10	23.43	24.06	23.89	23.52	24.10	23.97	22.56	23.16
MnO	1.16	1.17	1.26	0.81	0.66	0.64	0.55	0.64	0.24	0.29	0.40	0.84	0.82
MgO	4.07	3.89	3.24	3.25	3.89	4.05	4.39	4.44	5.06	4.51	4.23	3.98	3.85
CaO	13.03	12.33	13.43	12.76	11.97	11.85	11.37	10.93	10.77	11.11	11.70	12.61	12.15
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.09	0.07	0.05	0.01	0.03	0.03	0.01	0.02	0.04	0.01	0.01	0.04	0.03
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.26	100.83	101.44	101.21	101.56	100.94	101.59	100.54	101.28	100.83	101.08	100.93	100.90
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.99	3.00	2.98	2.99	2.98	3.00	2.99	2.97	2.99	2.98	2.97	2.98	2.99
Ti	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Al	1.96	1.98	2.00	2.00	2.00	1.99	2.00	2.02	2.02	2.01	2.01	2.00	2.01
Fe^{2+}	1.37	1.45	1.42	1.50	1.50	1.51	1.51	1.51	1.50	1.52	1.49	1.43	1.48
Mn	0.08	0.08	0.08	0.05	0.04	0.04	0.04	0.04	0.02	0.02	0.03	0.05	0.05
Mg	0.47	0.45	0.37	0.37	0.45	0.47	0.50	0.51	0.58	0.52	0.49	0.46	0.44
Ca	1.07	1.02	1.11	1.06	0.98	0.98	0.93	0.91	0.88	0.92	0.96	1.04	1.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.05	0.02	0.04	0.02	0.05	0.00	0.03	0.04	0.00	0.03	0.05	0.02	0.02
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 4.6	Grt 4.7	Grt 4.8	Grt 4.9	Grt 5.1	Grt 5.2	Grt 5.3	Grt 5.4	Grt 5.5	Grt 5.6	Grt 5.7	Grt 5.8	Grt 5.9
SiO_2	38.60	38.33	39.02	38.35	39.73	39.03	38.89	38.80	38.98	38.95	39.05	38.96	38.74
TiO_2	0.10	*n.d.*	0.10	0.05	0.11	0.05	0.06	0.07	0.05	0.04	0.04	0.03	0.08
Al_2O_3	22.02	21.83	22.17	21.91	22.19	22.18	21.98	22.12	22.10	22.01	22.15	22.07	21.73
Fe*	21.73	23.27	22.99	24.12	24.92	24.44	24.64	24.09	22.86	22.53	22.43	22.12	23.18
MnO	1.15	1.51	0.67	1.13	0.51	0.50	0.41	0.62	0.95	1.16	1.11	1.09	1.08
MgO	3.57	2.40	4.27	3.69	4.18	4.19	3.70	3.73	3.32	3.75	3.58	3.66	4.21
CaO	13.69	13.64	11.95	11.23	10.63	11.01	11.66	11.82	13.36	12.78	13.14	13.55	11.56
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.06	0.06	0.04	0.05	0.11	0.03	0.07	0.04	0.02	0.10	0.07	0.06	0.05
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.91	101.04	101.21	100.54	102.38	101.42	101.41	101.29	101.64	101.32	101.57	101.54	100.62
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.97	2.98	3.00	2.98	3.02	3.00	3.00	2.99	2.99	2.99	2.99	2.98	3.00
Ti	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	2.00	2.00	2.01	2.01	1.99	2.01	2.00	2.01	2.00	1.99	2.00	1.99	1.98
Fe^{2+}	1.35	1.45	1.48	1.54	1.58	1.57	1.58	1.54	1.44	1.43	1.43	1.38	1.48
Mn	0.08	0.10	0.04	0.07	0.03	0.03	0.03	0.04	0.06	0.08	0.07	0.07	0.07
Mg	0.41	0.28	0.49	0.43	0.47	0.48	0.42	0.43	0.38	0.43	0.41	0.42	0.49
Ca	1.13	1.13	0.98	0.94	0.87	0.91	0.96	0.98	1.10	1.05	1.08	1.11	0.96
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Fe^{3+}	0.05	0.06	0.00	0.03	0.00	0.00	0.01	0.01	0.02	0.02	0.01	0.04	0.02
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	7.98	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Grt 5.10	Grt 5.11	Grt 5.12	Grt 5.13	Grt 5.14	Grt 5.15	Grt 6.1	Grt 6.2	Grt 6.3	Grt 6.4	Grt 6.5	Grt 6.6	Grt 6.7
SiO_2	38.75	38.88	39.10	38.92	39.17	38.86	38.71	38.98	38.84	38.97	39.29	39.08	39.20
TiO_2	0.12	0.09	0.05	0.07	0.17	0.12	0.06	0.06	0.07	*n.d.*	0.08	0.04	0.06
Al_2O_3	21.68	21.81	22.02	22.09	22.12	22.04	22.01	22.05	22.18	21.94	21.89	21.90	21.75
Fe*	23.22	22.83	22.91	22.17	22.65	23.15	23.06	22.85	23.61	21.98	22.55	22.62	22.24
MnO	1.09	1.10	1.02	0.99	0.88	0.71	0.84	0.83	0.75	1.39	1.09	1.14	1.30
MgO	4.34	3.86	4.08	3.81	3.94	4.22	3.18	3.62	3.94	3.12	4.20	4.27	4.22
CaO	11.87	12.82	11.94	13.24	13.35	11.90	12.99	12.93	12.21	13.95	11.99	12.03	12.61
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.04	0.04	*n.d.*	0.07	0.04	0.05	0.04	0.01	0.04	0.04	0.09	0.10	0.07
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.12	101.43	101.12	101.37	102.31	101.04	100.89	101.33	101.64	101.39	101.19	101.18	101.45
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	2.99	3.01	2.98	2.98	2.99	3.00	3.00	2.98	3.00	3.02	3.00	3.00
Ti	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.97	1.97	2.00	2.00	1.98	2.00	2.01	2.00	2.00	1.99	1.98	1.98	1.96
Fe^{2+}	1.43	1.41	1.47	1.39	1.39	1.48	1.49	1.46	1.47	1.39	1.45	1.44	1.40
Mn	0.07	0.07	0.07	0.06	0.06	0.05	0.06	0.05	0.05	0.09	0.07	0.07	0.08
Mg	0.50	0.44	0.47	0.44	0.45	0.48	0.37	0.41	0.45	0.36	0.48	0.49	0.48
Ca	0.98	1.05	0.98	1.09	1.09	0.98	1.08	1.06	1.00	1.15	0.99	0.99	1.03
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Fe^{3+}	0.06	0.05	0.00	0.03	0.05	0.01	0.00	0.01	0.04	0.02	0.00	0.01	0.03
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	7.99	8.00	8.00

Mineral							Garnet						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 03A	SPF 03A	SPF 03A
Anl code	Grt 6.8	Grt 6.9	Grt 6.10	Grt 6.11	Grt 6.12	Grt 6.13	Grt 6.14	Grt 6.15	Grt 6.16	Grt 6.17	Grt 1.1	Grt 1.2	Grt 1.3
SiO_2	39.07	39.03	38.74	38.90	39.02	38.89	38.76	38.79	38.98	39.25	39.15	38.35	38.27
TiO_2	0.10	0.12	0.15	0.17	0.20	0.20	0.22	0.21	0.21	0.05	0.07	0.10	0.03
Al_2O_3	21.73	21.62	21.71	21.63	21.72	21.62	21.70	21.55	21.60	22.37	22.27	21.74	21.92
Fe*	22.26	22.21	22.05	22.45	22.66	22.65	22.53	22.47	22.57	22.83	23.81	24.47	23.09
MnO	1.34	1.33	1.34	1.34	1.31	1.33	1.29	1.25	1.12	0.92	0.51	0.34	0.62
MgO	4.38	4.33	4.23	4.29	4.26	4.22	4.20	4.21	4.12	3.87	5.23	4.62	4.96
CaO	12.29	12.35	12.40	12.23	12.15	12.49	12.27	12.46	12.19	11.92	9.84	10.55	10.94
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.15	0.05	0.02	0.04	0.05	0.05	0.03	0.06	0.05	0.06	0.04	0.04	0.05
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.32	101.04	100.65	101.05	101.38	101.45	101.00	101.00	100.83	101.27	100.92	100.21	99.88
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	3.00	3.00	2.99	2.99	2.99	2.98	2.99	2.99	3.01	3.01	3.00	2.98	2.97
Ti	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.00
Al	1.96	1.96	1.98	1.96	1.96	1.95	1.97	1.96	1.96	2.02	2.01	1.99	2.00
Fe^{2+}	1.40	1.40	1.39	1.41	1.43	1.39	1.41	1.40	1.46	1.46	1.53	1.54	1.44
Mn	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.07	0.06	0.03	0.02	0.04
Mg	0.50	0.50	0.49	0.49	0.49	0.48	0.48	0.48	0.47	0.44	0.60	0.53	0.57
Ca	1.01	1.02	1.03	1.01	1.00	1.03	1.01	1.03	1.01	0.98	0.81	0.88	0.91
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.03	0.03	0.03	0.04	0.03	0.06	0.04	0.05	0.00	0.00	0.00	0.05	0.06
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	7.98	7.99	8.00	8.00

Mineral							Garnet						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Grt 1.4	Grt 1.5	Grt 1.6	Grt 1.7	Grt 1.8	Grt 1.9	Grt 1.10	Grt 1.11	Grt 1.12	Grt 1.13	Grt 1.14	Grt 1.15	Grt 1.16
SiO_2	38.28	38.23	38.49	38.30	38.75	38.33	37.67	37.64	38.51	38.09	38.04	38.03	38.00
TiO_2	0.06	0.03	0.06	0.14	0.05	0.06	0.12	0.08	0.10	0.03	0.12	0.09	*n.d.*
Al_2O_3	21.87	21.89	21.85	21.58	21.62	21.98	21.59	21.62	21.98	21.86	21.73	21.75	22.06
Fe*	22.76	22.65	22.88	23.17	22.55	23.64	23.67	22.92	23.60	23.74	23.76	23.35	23.48
MnO	0.60	0.67	0.60	0.60	0.53	0.50	0.53	0.49	0.50	0.62	0.53	0.54	0.52
MgO	5.32	5.36	5.35	5.15	5.17	5.69	5.40	5.55	5.42	5.37	5.31	5.54	5.61
CaO	10.87	10.38	10.43	11.02	10.28	9.53	10.27	10.45	9.94	9.55	10.19	9.68	9.73
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.04	0.05	0.05	0.07	0.04	*n.d.*	0.03	*n.d.*	0.04	0.01	0.01	0.03	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.81	99.26	99.71	100.03	98.99	99.73	99.29	98.76	100.09	99.27	99.68	99.00	99.41
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.97	2.98	2.99	2.97	3.02	2.97	2.94	2.95	2.98	2.97	2.96	2.97	2.96
Ti	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.00
Al	2.00	2.01	2.00	1.97	1.99	2.01	1.99	1.99	2.00	2.01	1.99	2.00	2.02
Fe^{2+}	1.40	1.44	1.46	1.42	1.47	1.48	1.42	1.39	1.49	1.50	1.46	1.48	1.45
Mn	0.04	0.04	0.04	0.04	0.03	0.03	0.04	0.03	0.03	0.04	0.03	0.04	0.03
Mg	0.61	0.62	0.62	0.59	0.60	0.66	0.63	0.65	0.63	0.62	0.62	0.65	0.65
Ca	0.90	0.87	0.87	0.91	0.86	0.79	0.86	0.88	0.82	0.80	0.85	0.81	0.81
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.04	0.03	0.08	0.00	0.05	0.13	0.11	0.03	0.05	0.09	0.05	0.08
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	7.98	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Grt 1.17	Grt 1.18	Grt 1.19	Grt 1.20	Grt 2.1	Grt 2.2	Grt 2.3	Grt 2.4	Grt 2.5	Grt 2.6	Grt 2.7	Grt 2.8	Grt 2.9
SiO_2	38.15	37.94	37.52	39.24	39.28	39.14	38.99	38.61	38.82	38.91	38.36	38.90	38.32
TiO_2	0.06	0.08	0.04	0.10	0.03	*n.d.*	0.09	0.11	0.07	0.07	0.11	0.06	0.05
Al_2O_3	22.04	21.85	21.84	22.83	22.52	22.25	22.10	21.77	22.07	22.11	22.00	22.11	22.05
Fe*	23.02	22.83	23.62	22.33	24.16	23.58	23.48	25.14	23.90	23.32	23.28	23.17	23.91
MnO	0.49	0.45	0.43	0.50	0.32	0.48	0.24	0.23	0.25	0.27	0.32	0.26	0.55
MgO	5.42	5.56	5.64	4.68	6.78	6.02	5.73	4.40	5.65	5.73	6.06	6.37	6.59
CaO	10.44	10.34	9.79	9.73	8.46	9.69	9.76	10.58	9.85	10.02	9.69	9.42	7.20
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.02	0.02	0.01	*n.d.*	0.03	0.02	0.05	0.02	0.09	0.03	0.02	0.02	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	99.64	99.07	98.89	99.41	101.59	101.18	100.44	100.87	100.70	100.46	99.84	100.32	98.66
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.96	2.96	2.93	3.03	2.98	2.99	3.00	2.98	2.98	2.99	2.96	2.99	2.99
Ti	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00
Al	2.02	2.01	2.01	2.08	2.01	2.00	2.00	1.98	2.00	2.00	2.00	2.00	2.03
Fe^{2+}	1.43	1.41	1.42	1.44	1.50	1.47	1.51	1.58	1.50	1.49	1.44	1.46	1.56
Mn	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.04
Mg	0.63	0.65	0.66	0.54	0.77	0.68	0.66	0.51	0.65	0.66	0.70	0.73	0.77
Ca	0.87	0.86	0.82	0.80	0.69	0.79	0.80	0.88	0.81	0.83	0.80	0.77	0.60
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.07	0.12	0.00	0.03	0.03	0.00	0.04	0.03	0.01	0.06	0.03	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	7.93	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	7.99

Mineral							Garnet						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Grt 2.10	Grt 2.11	Grt 3.1	Grt 3.2	Grt 3.3	Grt 3.4	Grt 3.5	Grt 3.6	Grt 3.7	Grt 3.8	Grt 3.9	Grt 3.10	Grt 3.11
SiO_2	39.01	39.17	38.20	38.33	38.51	37.96	38.13	37.52	37.31	37.98	37.76	37.76	37.62
TiO_2	0.08	0.04	0.08	0.09	0.06	0.08	0.05	0.20	0.13	0.07	0.06	0.10	0.13
Al_2O_3	22.26	22.06	21.72	21.74	21.88	21.97	22.05	21.51	21.57	21.79	21.30	21.90	21.67
Fe*	23.44	23.04	24.62	23.32	23.31	23.29	22.98	23.42	23.41	23.72	23.78	23.72	24.27
MnO	0.23	0.35	0.81	0.56	0.56	0.65	0.62	0.75	0.71	0.58	0.51	0.53	0.55
MgO	6.46	6.56	4.57	5.62	5.87	5.43	5.21	4.70	4.56	4.86	5.31	5.22	5.35
CaO	9.31	9.19	10.02	10.17	9.57	10.12	10.80	10.98	11.16	10.91	9.79	10.39	9.54
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.04	0.12	0.05	0.07	0.01	0.05	0.02	0.02	0.07	0.01	0.03	0.04	0.04
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.83	100.52	100.07	99.91	99.77	99.54	99.85	99.10	98.91	99.93	98.53	99.66	99.17
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	3.00	2.98	2.97	2.98	2.95	2.95	2.94	2.93	2.95	2.97	2.94	2.94
Ti	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01
Al	2.00	1.99	1.99	1.98	2.00	2.01	2.01	1.99	2.00	1.99	1.98	2.01	2.00
Fe^{2+}	1.46	1.47	1.55	1.44	1.47	1.43	1.41	1.42	1.41	1.44	1.48	1.43	1.48
Mn	0.01	0.02	0.05	0.04	0.04	0.04	0.04	0.05	0.05	0.04	0.03	0.03	0.04
Mg	0.74	0.75	0.53	0.65	0.68	0.63	0.60	0.55	0.53	0.56	0.62	0.61	0.62
Ca	0.76	0.75	0.84	0.84	0.79	0.84	0.90	0.92	0.94	0.91	0.83	0.87	0.80
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.03	0.01	0.05	0.07	0.04	0.08	0.08	0.11	0.13	0.10	0.08	0.11	0.11
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral						Garnet							
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A
Anl code	Grt 3.12	Grt 3.13	Grt 3.14	Grt 3.15	Grt 4.1	Grt 4.2	Grt 4.3	Grt 4.4	Grt 4.5	Grt 4.6	Grt 4.7	Grt 4.8	Grt 4.9
SiO_2	37.86	37.80	38.22	37.98	39.17	38.97	38.79	39.27	38.99	39.00	38.90	38.86	38.25
TiO_2	0.03	0.06	0.08	0.10	0.07	0.05	0.04	0.10	0.06	0.10	0.05	0.06	0.10
Al_2O_3	21.95	21.59	21.91	21.93	22.18	21.88	21.87	22.02	21.96	22.03	21.89	22.12	21.86
Fe*	23.04	24.62	23.20	24.49	24.16	25.40	24.81	23.04	22.79	23.17	22.74	22.87	23.81
MnO	0.38	0.80	0.23	0.23	0.41	0.26	0.52	0.64	0.52	0.54	0.50	0.45	0.56
MgO	6.61	5.41	6.15	5.04	4.82	4.25	4.39	4.96	5.18	5.29	5.61	5.74	5.44
CaO	8.54	8.52	9.40	10.05	10.57	10.58	10.87	11.11	11.16	10.65	10.69	10.41	9.95
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.03	0.02	*n.d.*	0.05	0.05	0.08	0.03	0.04	0.06	0.01	*n.d.*	0.04	0.03
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.43	98.82	99.19	99.87	101.43	101.48	101.31	101.18	100.73	100.79	100.39	100.55	100.00
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.96	2.97	2.97	2.95	3.00	3.00	2.98	3.01	2.99	2.99	2.99	2.98	2.96
Ti	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.01
Al	2.02	2.00	2.01	2.01	2.00	1.98	1.98	1.99	1.99	1.99	1.98	2.00	2.00
Fe^{2+}	1.44	1.56	1.46	1.51	1.55	1.62	1.54	1.48	1.44	1.47	1.43	1.44	1.47
Mn	0.03	0.05	0.02	0.02	0.03	0.02	0.03	0.04	0.03	0.04	0.03	0.03	0.04
Mg	0.77	0.63	0.71	0.58	0.55	0.49	0.50	0.57	0.59	0.61	0.64	0.66	0.63
Ca	0.72	0.72	0.78	0.84	0.87	0.87	0.90	0.91	0.92	0.88	0.88	0.86	0.83
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.06	0.06	0.05	0.08	0.00	0.02	0.05	0.00	0.02	0.01	0.03	0.03	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03A	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Grt 4.10	Grt 4.11	Grt 4.12	Grt 4.13	Grt 4.14	Grt 1.2	Grt 1.3	Grt 1.4	Grt 1.5	Grt 1.6	Grt 1.7	Grt 1.8	Grt 1.9
SiO_2	38.61	38.37	38.21	38.41	38.79	39.03	38.96	38.56	38.93	38.95	38.56	38.64	38.56
TiO_2	0.07	0.09	0.02	0.03	0.02	0.09	0.09	0.12	0.02	0.05	0.08	0.03	0.01
Al_2O_3	21.94	21.98	22.06	22.09	22.28	22.04	22.14	21.78	22.32	22.20	21.70	21.87	22.05
Fe*	22.95	22.61	23.28	24.95	23.56	24.11	24.47	24.62	24.00	23.66	23.54	25.00	24.89
MnO	0.40	0.35	0.41	0.65	0.52	0.55	0.60	0.78	0.57	0.45	0.36	0.72	0.61
MgO	5.95	6.02	5.99	5.69	6.39	5.31	5.21	4.90	5.44	5.47	5.59	5.15	5.51
CaO	10.30	10.57	9.30	8.62	8.93	9.68	9.72	9.79	9.55	9.91	9.92	9.09	8.77
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.07	0.01	0.07	0.01	0.06	0.04	0.02	0.02	*n.d.*	0.05	0.03	0.04	0.01
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.30	100.00	99.35	100.45	100.55	100.85	101.21	100.57	100.83	100.74	99.78	100.54	100.41
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.97	2.96	2.97	2.97	2.97	3.00	2.99	2.98	2.99	2.99	2.99	2.99	2.98
Ti	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Al	1.99	2.00	2.02	2.01	2.01	2.00	2.00	1.99	2.02	2.01	1.98	1.99	2.01
Fe^{2+}	1.41	1.37	1.47	1.55	1.47	1.55	1.55	1.55	1.54	1.52	1.49	1.59	1.57
Mn	0.03	0.02	0.03	0.04	0.03	0.04	0.04	0.05	0.04	0.03	0.02	0.05	0.04
Mg	0.68	0.69	0.69	0.65	0.73	0.61	0.60	0.57	0.62	0.63	0.65	0.59	0.63
Ca	0.85	0.87	0.77	0.71	0.73	0.80	0.80	0.81	0.79	0.82	0.82	0.75	0.73
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.07	0.09	0.05	0.06	0.04	0.00	0.02	0.04	0.00	0.00	0.03	0.03	0.04
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Grt 1.10	Grt 1.11	Grt 2.1	Grt 2.2	Grt 4.1	Grt 4.2	Grt 4.3	Grt 4.4	Grt 4.5	Grt 4.6	Grt 4.7	Grt 4.8	Grt 4.9
SiO_2	38.69	38.70	38.87	38.85	38.38	38.91	38.65	38.82	38.80	38.52	40.73	38.84	38.74
TiO_2	0.03	*n.d.*	0.07	0.08	0.05	*n.d.*	0.05	0.13	0.14	0.11	0.13	0.07	0.14
Al_2O_3	22.06	21.92	22.10	22.07	21.93	22.19	22.10	22.26	21.87	21.96	21.52	22.10	22.04
Fe*	24.83	24.23	24.61	24.28	25.28	23.99	23.60	23.74	24.15	23.67	21.65	23.55	23.70
MnO	0.78	0.54	0.36	0.41	0.87	0.37	0.46	0.49	0.46	0.45	0.41	0.48	0.48
MgO	4.99	4.96	5.35	5.60	4.97	5.68	5.48	5.49	5.59	5.63	4.95	5.68	5.62
CaO	9.09	10.22	9.70	9.53	8.77	9.97	10.14	10.18	9.79	10.10	9.18	9.54	9.98
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.03	0.05	0.02	*n.d.*	0.01	0.07	0.03	0.07	0.05	0.12	0.03	0.04	0.12
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.50	100.62	101.08	100.82	100.26	101.18	100.52	101.18	100.85	100.57	98.60	100.31	100.82
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	3.00	2.99	2.98	2.98	2.98	2.97	2.98	2.97	2.98	2.96	3.15	2.99	2.97
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01
Al	2.01	1.99	2.00	2.00	2.01	2.00	2.00	2.01	1.98	1.99	1.96	2.01	1.99
Fe^{2+}	1.61	1.53	1.55	1.53	1.61	1.48	1.47	1.48	1.50	1.45	1.40	1.52	1.48
Mn	0.05	0.04	0.02	0.03	0.06	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Mg	0.58	0.57	0.61	0.64	0.58	0.65	0.63	0.63	0.64	0.65	0.57	0.65	0.64
Ca	0.75	0.85	0.80	0.78	0.73	0.82	0.84	0.83	0.81	0.83	0.76	0.79	0.82
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Fe^{3+}	0.00	0.04	0.03	0.03	0.03	0.06	0.05	0.04	0.05	0.07	0.00	0.00	0.04
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	7.87	8.00	8.00

Mineral							Garnet						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Grt 4.10	Grt 4.11	Grt 4.12	Grt 4.13	Grt 4.14	Grt 4.15	Grt 4.16	Grt 4.17	Grt 5.1	Grt 5.2	Grt 5.3	Grt 5.4	Grt 5.5
SiO_2	38.67	38.68	38.92	38.72	38.58	38.81	38.67	37.82	38.58	38.86	38.83	38.89	38.74
TiO_2	0.07	0.08	0.04	0.02	0.03	0.03	*n.d.*	0.05	0.01	0.06	0.10	0.11	0.08
Al_2O_3	22.03	22.13	22.07	22.06	22.02	22.16	22.10	21.51	21.99	22.14	22.09	22.02	21.88
Fe*	23.73	23.15	23.75	24.37	24.12	24.33	24.67	23.74	24.99	23.82	23.32	23.60	24.22
MnO	0.43	0.40	0.44	0.44	0.47	0.53	0.56	0.88	0.65	0.37	0.42	0.43	0.64
MgO	5.61	5.66	5.76	5.68	5.57	5.65	5.69	4.58	5.61	5.93	5.48	5.36	4.81
CaO	9.88	9.80	9.62	9.44	9.68	9.25	8.82	9.62	8.46	9.30	10.33	10.28	9.84
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.d.*	0.02	0.01	0.01	*n.d.*	0.03	0.03	0.01	0.04	0.02	0.04	0.08	0.05
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.41	99.92	100.61	100.74	100.47	100.78	100.54	98.21	100.33	100.50	100.61	100.77	100.26
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	2.99	2.99	2.98	2.97	2.98	2.98	3.00	2.98	2.99	2.99	2.99	3.00
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Al	2.00	2.02	2.00	2.00	2.00	2.01	2.01	2.01	2.00	2.01	2.00	1.99	2.00
Fe^{2+}	1.49	1.50	1.50	1.51	1.50	1.53	1.55	1.57	1.59	1.51	1.48	1.50	1.57
Mn	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.06	0.04	0.02	0.03	0.03	0.04
Mg	0.64	0.65	0.66	0.65	0.64	0.65	0.65	0.54	0.65	0.68	0.63	0.61	0.56
Ca	0.82	0.81	0.79	0.78	0.80	0.76	0.73	0.82	0.70	0.77	0.85	0.85	0.82
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.04	0.00	0.02	0.05	0.06	0.03	0.04	0.00	0.03	0.02	0.02	0.02	0.00
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Grt 5.6	Grt 5.7	Grt 5.8	Grt 5.9	Grt 5.10	Grt 5.11	Grt 5.12	Grt 5.13	Grt 5.14	Grt 5.15	Grt 5.16	Grt 5.17	Grt 5.18
SiO_2	38.68	38.58	38.68	38.86	39.07	38.72	38.25	38.95	39.11	38.78	38.67	38.72	38.59
TiO_2	0.13	0.14	0.16	0.12	0.08	0.03	0.01	0.07	0.03	0.11	0.08	0.12	0.14
Al_2O_3	21.86	21.92	21.84	22.08	22.14	21.95	22.13	22.07	22.13	22.11	22.12	21.99	21.94
Fe*	23.90	23.91	24.77	24.33	24.03	25.84	25.83	23.96	23.97	25.09	25.66	24.49	24.32
MnO	0.58	0.57	0.69	0.64	0.50	1.12	0.65	0.35	0.45	0.52	0.57	0.53	0.54
MgO	5.32	5.16	4.94	5.02	5.20	4.42	5.16	5.23	5.26	5.13	5.24	4.95	5.16
CaO	9.87	10.21	9.84	10.00	9.95	8.96	8.29	10.25	10.08	9.50	8.55	9.83	10.24
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.05	0.05	0.04	0.03	0.03	0.04	0.01	0.04	0.01	0.05	0.03	0.02	*n.d.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.39	100.53	100.96	101.08	100.99	101.08	100.33	100.91	101.04	101.29	100.92	100.65	100.94
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.99	2.98	2.98	2.99	3.00	3.00	2.97	2.99	3.00	2.98	2.98	2.99	2.97
Ti	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01
Al	1.99	1.99	1.98	2.00	2.00	2.00	2.02	2.00	2.00	2.00	2.01	2.00	1.99
Fe^{2+}	1.52	1.50	1.56	1.55	1.54	1.66	1.63	1.52	1.53	1.57	1.63	1.57	1.50
Mn	0.04	0.04	0.05	0.04	0.03	0.07	0.04	0.02	0.03	0.03	0.04	0.03	0.04
Mg	0.61	0.59	0.57	0.58	0.60	0.51	0.60	0.60	0.60	0.59	0.60	0.57	0.59
Ca	0.82	0.84	0.81	0.82	0.82	0.74	0.69	0.84	0.83	0.78	0.71	0.81	0.84
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.02	0.04	0.04	0.02	0.00	0.01	0.04	0.02	0.00	0.04	0.02	0.01	0.07
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Grt 5.19	Grt 5.20	Grt 5.21	Grt 5.22	Grt 6.2	Grt 6.3	Grt 6.4	Grt 6.5	Grt 6.6	Grt 6.7	Grt 7.1	Grt 7.2	Grt 7.3
SiO_2	38.70	38.83	38.67	38.71	38.59	38.79	38.43	38.68	38.72	37.86	38.63	39.05	38.82
TiO_2	0.17	0.09	0.07	0.06	0.09	0.05	0.08	0.11	0.07	*n.d.*	*n.d.*	0.13	0.19
Al_2O_3	21.75	22.04	21.92	21.84	22.17	22.06	21.99	22.00	22.13	21.67	22.21	22.15	22.00
Fe*	24.18	24.34	24.07	24.14	24.12	24.05	24.55	24.16	23.56	25.65	25.69	24.32	23.76
MnO	0.48	0.49	0.45	0.48	0.38	0.33	0.49	0.53	0.37	1.00	0.89	0.44	0.47
MgO	5.04	5.20	5.25	4.88	5.36	5.06	4.98	4.94	5.40	4.43	5.07	5.41	5.22
CaO	10.53	10.02	9.95	9.89	9.88	10.12	10.12	10.00	10.10	9.07	8.59	10.04	10.45
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.02	0.02	0.01	0.04	0.02	0.04	0.07	*n.d.*	0.01	0.08	0.07	0.03	0.03
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.86	101.03	100.39	100.03	100.61	100.50	100.71	100.41	100.37	99.77	101.15	101.57	100.94
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	2.98	2.99	3.01	2.97	2.99	2.97	2.99	2.99	2.97	2.98	2.98	2.98
Ti	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01
Al	1.97	2.00	2.00	2.00	2.01	2.01	2.00	2.01	2.01	2.00	2.02	1.99	1.99
Fe^{2+}	1.50	1.53	1.53	1.57	1.51	1.55	1.52	1.56	1.50	1.61	1.62	1.51	1.50
Mn	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.02	0.07	0.06	0.03	0.03
Mg	0.58	0.60	0.60	0.56	0.62	0.58	0.57	0.57	0.62	0.52	0.58	0.62	0.60
Ca	0.87	0.82	0.82	0.82	0.82	0.84	0.84	0.83	0.83	0.76	0.71	0.82	0.86
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.05	0.04	0.03	0.00	0.04	0.00	0.06	0.01	0.02	0.07	0.04	0.04	0.03
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Grt 7.4	Grt 7.5	Grt 7.6	Grt 7.7	Grt 7.8	Grt 7.9	Grt 8.1	Grt 8.2	Grt 8.3	Grt 8.4	Grt 8.5	Grt 8.6	Grt 8.7
SiO_2	39.21	38.78	38.84	38.91	38.73	38.06	38.97	38.98	38.95	39.12	38.74	38.79	38.68
TiO_2	0.16	0.22	0.06	0.04	0.14	0.06	*n.d.*	0.17	0.02	0.09	0.19	0.04	0.08
Al_2O_3	21.96	21.80	21.99	22.09	21.87	21.92	22.33	21.84	22.06	21.74	21.99	22.28	22.17
Fe*	23.70	23.85	24.38	23.82	23.96	24.38	26.65	23.66	24.45	24.43	24.46	25.57	24.73
MnO	0.48	0.47	0.46	0.46	0.45	0.57	1.17	0.39	0.52	0.52	0.57	0.66	0.71
MgO	5.30	5.29	5.30	5.34	5.29	4.93	4.72	5.58	5.28	5.36	5.13	4.95	4.87
CaO	10.27	10.27	9.62	10.26	10.23	9.99	7.62	9.68	9.86	9.37	10.03	8.85	9.62
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.02	0.01	0.03	0.03	0.05	0.03	0.12	0.06	0.04	0.05	0.05	0.05	0.02
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.10	100.69	100.68	100.95	100.72	99.94	101.58	100.37	101.17	100.68	101.15	101.19	100.88
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	3.00	2.99	2.99	2.99	2.98	2.96	3.00	3.01	2.99	3.01	2.98	2.99	2.98
Ti	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00
Al	1.98	1.98	2.00	2.00	1.98	2.01	2.02	1.98	1.99	1.97	1.99	2.02	2.02
Fe^{2+}	1.52	1.51	1.56	1.49	1.50	1.51	1.71	1.53	1.53	1.57	1.53	1.64	1.58
Mn	0.03	0.03	0.03	0.03	0.03	0.04	0.08	0.03	0.03	0.03	0.04	0.04	0.05
Mg	0.61	0.61	0.61	0.61	0.61	0.57	0.54	0.64	0.60	0.62	0.59	0.57	0.56
Ca	0.84	0.85	0.79	0.84	0.84	0.83	0.63	0.80	0.81	0.77	0.83	0.73	0.79
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.03	0.02	0.03	0.04	0.07	0.00	0.00	0.04	0.00	0.04	0.01	0.02
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	7.99	8.00	8.00	8.00	8.00	8.00	8.00

Mineral							Garnet						
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B
Anl code	Grt 8.8	Grt 8.9	Grt 8.10	Grt 8.11	Grt 8.12	Grt 8.13	Grt 8.14	Grt 8.15	Grt 8.16	Grt 8.17	Grt 8.18	Grt 8.19	Grt 8.20
SiO_2	38.68	38.61	38.38	38.77	38.42	38.45	38.62	38.92	38.56	38.32	38.69	38.10	38.14
TiO_2	0.21	0.10	0.02	*n.d.*	0.16	0.02	0.08	*n.d.*	0.18	0.13	0.09	0.11	0.09
Al_2O_3	21.93	21.91	21.72	22.15	21.76	21.98	21.81	22.14	21.79	21.86	21.85	21.46	21.77
Fe*	25.27	24.97	26.38	26.97	24.94	26.79	25.06	24.91	25.63	25.12	25.00	26.86	25.96
MnO	0.70	0.52	0.88	0.86	0.56	0.74	0.68	0.52	0.53	0.56	0.73	0.92	0.65
MgO	4.63	5.06	4.30	4.66	4.77	4.76	4.67	5.13	4.97	4.83	4.38	4.01	4.18
CaO	9.72	9.60	9.00	8.01	9.88	8.28	9.49	9.45	9.52	9.58	10.00	9.30	9.36
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	0.04	0.03	0.03	0.04	0.06	0.04	0.04	0.06	0.04	0.04	*n.d.*	0.03	0.05
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	101.17	100.80	100.71	101.46	100.56	101.06	100.45	101.13	101.22	100.44	100.74	100.79	100.20
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Si	2.98	2.98	2.98	2.99	2.98	2.97	3.00	2.99	2.97	2.97	3.00	2.97	2.98
Ti	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Al	1.99	1.99	1.99	2.01	1.99	2.00	1.99	2.01	1.98	2.00	1.99	1.97	2.00
Fe^{2+}	1.61	1.57	1.67	1.73	1.57	1.68	1.62	1.58	1.58	1.58	1.61	1.66	1.66
Mn	0.05	0.03	0.06	0.06	0.04	0.05	0.04	0.03	0.03	0.04	0.05	0.06	0.04
Mg	0.53	0.58	0.50	0.54	0.55	0.55	0.54	0.59	0.57	0.56	0.51	0.47	0.49
Ca	0.80	0.79	0.75	0.66	0.82	0.69	0.79	0.78	0.79	0.80	0.83	0.78	0.78
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.02	0.04	0.04	0.01	0.05	0.05	0.01	0.02	0.07	0.05	0.01	0.09	0.03
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Mineral				Garnet						Ilmenite			
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03A	SPF 03A	SPF 03A	SPF 03B	SPF 03B	SPF 03B
Anl code	Grt 8.22	Grt 8.23	Grt 8.24	Grt 8.25	Grt 8.26	Grt 8.27	Grt 8.28	Op 1.1	Op 1.2	Op 1.3	Op 1.1	Op 1.2	Op 1.3
SiO_2	38.31	37.81	38.20	37.53	38.05	38.65	38.51	0.03	0.02	*n.d.*	0.02	0.03	*n.d.*
TiO_2	0.11	0.05	0.13	0.09	0.15	0.03	0.03	50.61	50.03	49.38	50.38	49.41	50.38
Al_2O_3	21.40	21.80	21.71	21.61	21.88	22.15	21.81	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	0.01
Fe*	25.93	27.15	25.55	24.74	24.76	24.85	26.16	48.40	47.68	47.50	47.86	47.82	48.58
MnO	0.76	0.97	0.68	0.67	0.63	0.49	0.72	0.97	0.97	0.92	0.50	0.48	0.48
MgO	4.25	4.38	4.62	4.51	4.71	5.33	4.90	0.17	0.14	0.16	0.86	0.82	0.86
CaO	9.24	7.85	9.54	9.80	10.07	8.93	8.41	0.04	0.01	0.05	0.08	0.06	0.03
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.d.*	*n.d.*	0.02	0.04	0.21	*n.d.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	0.01	0.02	*n.d.*	0.02	*n.d.*	0.02
Cr_2O_3	0.08	0.01	0.03	0.05	0.07	*n.d.*	0.02	0.04	0.06	0.06	0.04	0.04	0.07
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.d.*	0.07	0.05	0.05	0.02	0.02
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.07	100.01	100.47	98.99	100.31	100.44	100.56	100.27	99.02	98.15	99.85	98.89	100.45
Oxygens	12.00	12.00	12.00	12.00	12.00	12.00	12.00	3.00	3.00	3.00	3.00	3.00	3.00
Si	3.00	2.97	2.97	2.96	2.95	2.99	2.99	0.00	0.00	0.00	0.00	0.00	0.00
Ti	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.95	0.96	0.95	0.95	0.94	0.94
Al	1.97	2.01	1.99	2.01	2.00	2.02	2.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	1.68	1.72	1.59	1.55	1.53	1.60	1.67	0.93	0.93	0.92	0.90	0.87	0.90
Mn	0.05	0.06	0.04	0.04	0.04	0.03	0.05	0.02	0.02	0.02	0.01	0.01	0.01
Mg	0.50	0.51	0.54	0.53	0.55	0.61	0.57	0.01	0.01	0.01	0.03	0.03	0.03
Ca	0.77	0.66	0.79	0.83	0.84	0.74	0.70	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.02	0.06	0.07	0.08	0.08	0.01	0.03	0.09	0.09	0.10	0.10	0.13	0.11
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.00	8.00	8.00	2.00	2.00	2.00	2.00	2.00	2.00

Mineral	Ilmenite												Epidote
Sample	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 03B	SPF 01A2
Anl code	Op 1.4	Op 1.5	Op 2.1	Op 2.2	Op 2.3	Op 2.4	Op 2.5	Op 3.1	Op 3.2	Op 3.3	Op 3.4	Op 3.5	Ep 1.1
SiO_2	*n.d.*	0.03	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	0.01	0.03	*n.d.*	0.05	38.30
TiO_2	50.50	50.99	51.21	51.26	50.11	51.50	51.27	49.53	50.24	49.99	51.17	50.22	0.09
Al_2O_3	*n.d.*	0.02	0.01	0.04	*n.d.*	*n.d.*	0.01	0.02	0.02	*n.d.*	*n.d.*	*n.d.*	28.90
Fe*	48.60	48.41	48.24	47.72	48.17	47.86	47.67	49.19	49.63	49.15	47.97	47.15	6.89
MnO	0.46	0.49	0.40	0.42	0.44	0.43	0.46	0.46	0.44	0.48	0.48	0.63	0.03
MgO	0.91	0.84	0.66	0.64	0.62	0.64	0.66	0.18	0.19	0.17	0.22	0.19	*n.d.*
CaO	0.04	*n.d.*	0.01	0.02	0.01	0.01	0.01	0.06	0.01	*n.d.*	0.06	0.11	23.70
Na_2O	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	0.02	*n.d.*	*n.d.*	*n.d.*	0.02	0.02	*n.a.*
K_2O	0.02	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.02	*n.d.*	*n.d.*	*n.a.*
Cr_2O_3	0.04	0.05	0.02	0.05	0.03	0.05	0.04	0.04	0.04	0.05	0.03	0.04	*n.a.*
ZnO	0.08	0.02	0.06	0.08	0.02	0.08	0.11	0.02	0.05	*n.d.*	0.05	0.03	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	100.65	100.85	100.63	100.25	99.43	100.57	100.25	99.50	100.65	99.89	100.01	98.45	97.91
Oxygens	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	12.50
Si	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.97
Ti	0.94	0.95	0.96	0.96	0.95	0.97	0.96	0.94	0.94	0.95	0.97	0.96	0.00
Al	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.64
Fe^{2+}	0.90	0.91	0.92	0.93	0.92	0.93	0.93	0.92	0.93	0.93	0.94	0.94	0.00
Mn	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Mg	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.97
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.11	0.09	0.08	0.07	0.10	0.07	0.07	0.12	0.11	0.10	0.06	0.07	0.40
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	8.00

Mineral							Epidote						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2
Anl code	Ep 1.2	Ep 1.3	Ep 1.4	Ep 1.5	Ep 1.6	Ep 1.7	Ep 1.8	Ep 2.1	Ep 2.2	Ep 2.3	Ep 2.4	Ep 3.1	Ep 3.2
SiO_2	38.56	38.60	38.10	38.41	38.35	38.53	38.51	38.43	38.21	38.06	38.24	38.56	38.46
TiO_2	0.16	0.18	0.20	0.24	0.19	0.14	0.13	0.19	0.24	0.19	0.24	0.22	0.28
Al_2O_3	28.69	28.83	28.38	28.82	28.46	29.15	28.86	28.79	28.27	29.08	28.53	28.99	29.13
Fe*	7.18	7.05	7.24	6.95	7.65	7.13	7.17	6.99	7.70	6.99	7.11	6.72	6.57
MnO	0.03	0.03	0.05	0.05	0.03	0.02	0.03	*n.d.*	0.03	0.04	0.03	0.01	0.04
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.03
CaO	23.82	23.59	23.71	23.74	23.67	23.49	23.81	23.65	23.76	23.53	23.37	23.71	23.47
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.43	98.27	97.67	98.21	98.36	98.45	98.51	98.06	98.21	97.88	97.52	98.21	97.98
Oxygens	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
Si	2.98	2.98	2.97	2.97	2.97	2.97	2.97	2.98	2.97	2.96	2.98	2.98	2.98
Ti	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Al	2.61	2.63	2.61	2.63	2.60	2.65	2.63	2.63	2.59	2.66	2.62	2.64	2.66
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	1.97	1.95	1.98	1.97	1.97	1.94	1.97	1.96	1.98	1.96	1.95	1.96	1.95
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.42	0.41	0.42	0.40	0.45	0.41	0.42	0.41	0.45	0.41	0.42	0.39	0.38
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	7.99	8.00	8.00	8.00	7.99	8.00	7.99	8.00	8.00	7.99	7.99	7.99

Mineral							Epidote						
Sample	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01A2	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Ep 3.3	Ep 3.4	Ep 3.5	Ep 3.6	Ep 4.1	Ep 4.2	Ep 4.3	Ep 4.4	Ep 4.5	Ep 4.6	Ep 1.1	Ep 1.2	Ep 1.3
SiO_2	38.47	38.49	38.24	38.27	38.92	39.20	39.35	36.86	39.31	38.94	38.52	38.61	38.34
TiO_2	0.21	0.28	0.18	0.19	0.04	0.08	0.02	0.07	0.08	0.05	0.23	0.13	0.19
Al_2O_3	29.23	29.12	28.72	29.21	32.15	32.52	32.75	30.31	32.46	32.22	29.48	29.03	28.16
Fe*	6.66	6.84	6.92	6.53	3.04	2.38	2.60	3.78	2.88	2.98	6.44	6.67	7.86
MnO	0.02	0.04	*n.d.*	*n.d.*	0.01	*n.d.*	0.02	0.03	0.02	*n.d.*	0.02	0.04	0.10
MgO	*n.d.*	*n.d.*	0.09	0.04	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*
CaO	23.84	23.95	23.35	23.45	24.32	24.61	24.23	23.22	24.41	24.33	23.74	23.71	23.80
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.42	98.72	97.50	97.70	98.48	98.79	98.97	94.27	99.15	98.52	98.44	98.19	98.45
Oxygens	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
Si	2.97	2.96	2.98	2.97	2.96	2.97	2.97	2.94	2.97	2.96	2.97	2.98	2.97
Ti	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Al	2.66	2.64	2.64	2.67	2.88	2.90	2.91	2.85	2.89	2.89	2.68	2.64	2.57
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Mg	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	1.97	1.98	1.95	1.95	1.98	2.00	1.96	1.99	1.98	1.98	1.96	1.96	1.98
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.39	0.40	0.41	0.38	0.17	0.14	0.15	0.23	0.16	0.17	0.37	0.39	0.46
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	7.99	7.99	8.01	8.01	8.00	8.01	8.00	8.01	7.99	7.99	8.00

Mineral							Epidote						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Ep 1.5	Ep 1.6	Ep 1.7	Ep 2.1	Ep 2.2	Ep 2.3	Ep 2.4	Ep 2.5	Ep 2.6	Ep 2.7	Ep 2.8	Ep 3.1	Ep 3.2
SiO_2	38.75	38.55	38.50	38.84	38.58	38.51	38.27	38.48	38.40	38.70	38.37	38.36	38.54
TiO_2	0.32	0.28	0.19	0.19	0.22	0.19	0.23	0.25	0.20	0.26	0.29	0.15	0.07
Al_2O_3	28.01	28.92	28.90	29.54	29.40	28.21	27.64	27.82	29.29	28.46	28.29	28.60	28.83
Fe*	8.20	6.71	7.08	6.54	6.43	7.74	9.06	8.39	6.39	7.32	7.99	7.46	7.10
MnO	0.15	0.02	0.02	0.02	0.02	0.10	0.17	0.14	0.03	0.06	0.09	0.05	0.04
MgO	*n.d.*	0.01	*n.d.*	*n.d.*	0.01	0.03	*n.d.*	*n.d.*	0.02	0.01	*n.d.*	*n.d.*	*n.d.*
CaO	23.40	23.56	24.09	23.62	24.12	23.75	23.44	23.46	23.60	23.86	23.78	23.85	23.71
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.83	98.05	98.79	98.75	98.77	98.52	98.81	98.53	97.93	98.67	98.81	98.47	98.29
Oxygens	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
Si	2.99	2.98	2.97	2.98	2.97	2.98	2.97	2.98	2.97	2.99	2.97	2.97	2.98
Ti	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.00
Al	2.55	2.64	2.62	2.67	2.66	2.57	2.53	2.54	2.67	2.59	2.58	2.61	2.63
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	1.94	1.95	1.99	1.94	1.99	1.97	1.95	1.95	1.96	1.97	1.97	1.98	1.97
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.48	0.39	0.41	0.38	0.37	0.45	0.53	0.49	0.37	0.43	0.46	0.43	0.41
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.98	7.99	8.00	7.98	8.00	8.00	7.99	7.99	7.99	7.99	8.00	8.00	7.99

Mineral							Epidote						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Ep 3.3	Ep 3.4	Ep 3.5	Ep 3.6	Ep 3.7	Ep 3.8	Ep 3.9	Ep 3.10	Ep 3.11	Ep 3.12	Ep 3.13	Ep 3.14	Ep 5.1
SiO_2	38.21	39.24	39.38	39.19	38.98	39.09	39.23	39.47	39.13	39.46	39.29	39.24	38.23
TiO_2	0.25	*n.d.*	0.03	0.13	0.04	0.06	0.06	0.08	0.04	0.06	*n.d.*	0.05	0.23
Al_2O_3	28.69	33.00	32.76	32.18	32.43	32.19	32.29	32.49	32.25	32.41	32.53	32.09	28.80
Fe*	7.01	2.15	2.23	2.91	2.82	2.93	2.96	2.41	2.96	2.57	2.70	3.00	6.89
MnO	0.05	0.02	0.01	0.01	0.04	0.03	0.02	0.03	0.03	*n.d.*	*n.d.*	0.02	0.03
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.06
CaO	23.66	24.36	24.33	24.20	24.35	24.47	24.00	24.34	24.20	24.17	24.18	24.33	23.08
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	97.87	98.77	98.74	98.61	98.66	98.76	98.56	98.82	98.61	98.67	98.70	98.73	97.32
Oxygens	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
Si	2.97	2.97	2.98	2.97	2.96	2.97	2.98	2.98	2.97	2.99	2.98	2.98	2.98
Ti	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Al	2.63	2.94	2.92	2.88	2.90	2.88	2.89	2.90	2.89	2.89	2.90	2.87	2.65
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Ca	1.97	1.97	1.97	1.97	1.98	1.99	1.95	1.97	1.97	1.96	1.96	1.98	1.93
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.41	0.12	0.13	0.17	0.16	0.17	0.17	0.14	0.17	0.15	0.15	0.17	0.40
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.00	8.00	8.00	8.01	8.01	7.99	8.00	8.00	7.99	8.00	8.00	7.98

Mineral							Epidote						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Ep 5.2	Ep 5.3	Ep 4.1	Ep 4.2	Ep 4.3	Ep 4.4	Ep 4.5	Ep 4.6	Ep 4.7	Ep 4.8	Ep 4.9	Ep 4.10	Ep 4.11
SiO_2	38.15	38.58	39.09	39.22	39.14	39.43	39.29	39.29	39.17	39.31	39.38	39.21	39.30
TiO_2	0.18	0.19	0.02	0.05	0.06	0.07	0.03	0.03	0.11	0.13	0.14	*n.d.*	0.01
Al_2O_3	28.86	29.62	32.27	32.68	32.33	33.30	32.02	33.09	32.44	31.83	32.05	32.94	32.45
Fe*	6.46	6.16	2.81	2.38	2.78	1.92	3.31	2.14	2.65	2.91	3.15	2.00	2.59
MnO	0.02	0.05	0.01	*n.d.*	0.03	*n.d.*	0.01	0.04	0.02	*n.d.*	0.01	*n.d.*	0.03
MgO	0.03	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	23.09	23.84	24.20	24.23	24.44	24.24	24.40	24.35	24.27	24.35	24.26	24.24	24.56
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	96.79	98.44	98.40	98.56	98.78	98.97	99.05	98.93	98.65	98.53	98.99	98.40	98.93
Oxygens	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
Si	2.99	2.97	2.97	2.97	2.97	2.97	2.97	2.96	2.97	2.99	2.98	2.97	2.97
Ti	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00
Al	2.66	2.69	2.89	2.92	2.89	2.96	2.86	2.94	2.90	2.85	2.86	2.94	2.89
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	1.94	1.97	1.97	1.97	1.99	1.96	1.98	1.97	1.97	1.98	1.97	1.97	1.99
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.38	0.36	0.16	0.14	0.16	0.11	0.19	0.12	0.15	0.17	0.18	0.11	0.15
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.98	8.00	8.00	8.00	8.01	7.99	8.00	8.00	8.00	8.00	7.99	8.00	8.01

Mineral							Epidote						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Ep 4.12	Ep 4.13	Ep 4.14	Ep 4.15	Ep 4.16	Ep 4.17	Ep 6.1	Ep 6.2	Ep 6.3	Ep 6.4	Ep 7.1	Ep 7.2	Ep 7.3
SiO_2	39.06	39.15	39.33	39.28	39.22	39.29	39.07	39.45	39.15	39.32	39.37	39.24	39.14
TiO_2	0.10	0.01	0.07	0.04	*n.d.*	0.09	0.06	0.05	0.03	*n.d.*	0.01	0.12	0.06
Al_2O_3	32.73	32.60	33.04	32.61	33.14	32.35	31.46	32.57	31.23	32.93	33.11	32.75	31.85
Fe*	2.26	2.63	2.09	2.46	2.04	2.74	4.15	2.55	3.96	2.23	2.26	2.23	3.38
MnO	*n.d.*	*n.d.*	0.02	0.02	0.03	0.02	0.04	0.01	*n.d.*	0.03	0.04	0.02	0.04
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	24.45	24.37	24.59	24.39	24.26	24.35	24.36	24.26	24.15	24.55	24.38	24.51	24.05
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.60	98.76	99.14	98.80	98.69	98.83	99.14	98.89	98.52	99.06	99.18	98.87	98.52
Oxygens	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
Si	2.96	2.97	2.96	2.97	2.97	2.97	2.97	2.98	2.99	2.97	2.96	2.97	2.98
Ti	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Al	2.92	2.91	2.93	2.91	2.95	2.89	2.81	2.90	2.81	2.93	2.94	2.92	2.86
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	1.99	1.98	1.99	1.98	1.97	1.98	1.98	1.96	1.97	1.98	1.97	1.99	1.96
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.13	0.15	0.12	0.14	0.12	0.16	0.24	0.15	0.23	0.13	0.13	0.13	0.19
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.01	8.00	8.01	8.00	8.00	8.00	8.01	7.99	8.00	8.01	8.00	8.00	7.99

Mineral							Epidote						
Sample	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1	SPF 01C1
Anl code	Ep 7.4	Ep 7.5	Ep 7.6	Ep 7.7	Ep 7.8	Ep 7.9	Ep 7.10	Ep 7.11	Ep 8.1	Ep 8.2	Ep 8.3	Ep 8.4	Ep 8.5
SiO_2	39.25	38.93	39.40	38.59	38.24	39.24	39.30	39.35	39.12	39.16	39.13	39.03	39.22
TiO_2	0.06	0.07	0.08	0.28	0.36	0.12	0.06	0.03	0.11	0.05	0.06	0.04	0.07
Al_2O_3	32.70	32.82	32.63	28.61	28.38	32.51	32.27	32.49	32.22	32.55	32.32	32.50	32.57
Fe*	2.36	2.42	2.30	7.08	7.08	2.45	3.15	2.48	2.90	2.29	2.69	2.34	2.47
MnO	0.02	*n.d.*	0.04	0.01	0.05	0.02	0.01	*n.d.*	0.07	0.03	0.02	*n.d.*	*n.d.*
MgO	*n.d.*	*n.d.*	*n.d.*	*n.d.*	0.01	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*	*n.d.*
CaO	24.26	24.51	24.65	23.86	23.72	24.19	24.37	24.24	24.35	24.53	24.51	24.48	24.48
Na_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Cr_2O_3	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Total	98.65	98.75	99.10	98.42	97.84	98.52	99.17	98.60	98.76	98.61	98.73	98.39	98.81
Oxygens	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50	12.50
Si	2.97	2.95	2.97	2.98	2.98	2.98	2.97	2.98	2.97	2.97	2.97	2.97	2.97
Ti	0.00	0.00	0.00	0.02	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Al	2.92	2.93	2.90	2.61	2.60	2.91	2.87	2.90	2.88	2.91	2.89	2.91	2.91
Fe^{2+}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	1.97	1.99	1.99	1.98	1.98	1.97	1.97	1.97	1.98	1.99	1.99	1.99	1.99
Na	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.13	0.14	0.13	0.41	0.41	0.14	0.18	0.14	0.17	0.13	0.15	0.13	0.14
Zn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.00	8.01	8.01	7.99	8.00	8.00	8.00	8.00	8.00	8.01	8.01	8.01	8.00

Mineral	Epidote	
Sample	SPF 01C1	SPF 01C1
Anl code	Ep 8.6	Ep 8.7
SiO_2	39.07	39.16
TiO_2	0.11	0.05
Al_2O_3	32.18	32.15
Fe*	2.95	2.73
MnO	*n.d.*	0.03
MgO	*n.d.*	*n.d.*
CaO	24.42	24.45
Na_2O	*n.a.*	*n.a.*
K_2O	*n.a.*	*n.a.*
Cr_2O_3	*n.a.*	*n.a.*
ZnO	*n.a.*	*n.a.*
BaO	*n.a.*	*n.a.*
SrO	*n.a.*	*n.a.*
Total	98.73	98.57
Oxygens	12.50	12.50
Si	2.97	2.98
Ti	0.01	0.00
Al	2.88	2.88
Fe^{2+}	0.00	0.00
Mn	0.00	0.00
Mg	0.00	0.00
Ca	1.99	1.99
Na	0.00	0.00
K	0.00	0.00
Cr	0.00	0.00
Fe^{3+}	0.17	0.16
Zn	0.00	0.00
Ba	0.00	0.00
Sr	0.00	0.00
Total	8.01	8.01