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Preface

Over the last two decades, surface plasmon resonance (SPR) sensors have attracted a great deal of attention. A myriad of research reports have appeared describing advancements in SPR sensor technology and its applications. SPR sensor technology has been commercialized and SPR biosensors have become a central tool for characterizing and quantifying biomolecular interactions.

This book is intended to provide a comprehensive treatment of the field of SPR sensors. It is hoped that the material is sufficiently detailed to be of real value to both people involved directly with SPR sensors and to people using similar sensing methods.

The book is divided into three parts. Part I introduces readers to the fundamental principles of surface plasmon resonance (bio)sensors and covers the electromagnetic theory of surface plasmons, the theory of SPR sensors and includes an analysis of molecular interactions at sensor surfaces. Part II presents a review of the state-of-the-art in the development of two key elements of SPR biosensors: optical instrumentation and functionalization methods. Part III discusses applications of SPR biosensors. The part begins with a chapter devoted to applications of SPR sensors to research in molecular interactions. The following chapters discuss progress towards developing SPR biosensor-based detection systems suitable for field use and applications of SPR biosensors for the detection of chemical and biological analytes related to environmental monitoring, food safety and security, and medical diagnostics.

I would like to thank all of the contributors from around the world who have contributed material to this book. I am also indebted to Prof. Otto S. Wolfbeis, Editor of the Springer Series on Chemical Sensors and Biosensors and Peter W. Enders, Senior Executive Editor, Springer, for their support of this project. My special thanks go to my wife Hana, without whom this book could not have been written.



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