

Facile and one-step preparation carbon quantum dots from biomass residue and their applications as efficient surfactants

1. SEM analysis of CQDs

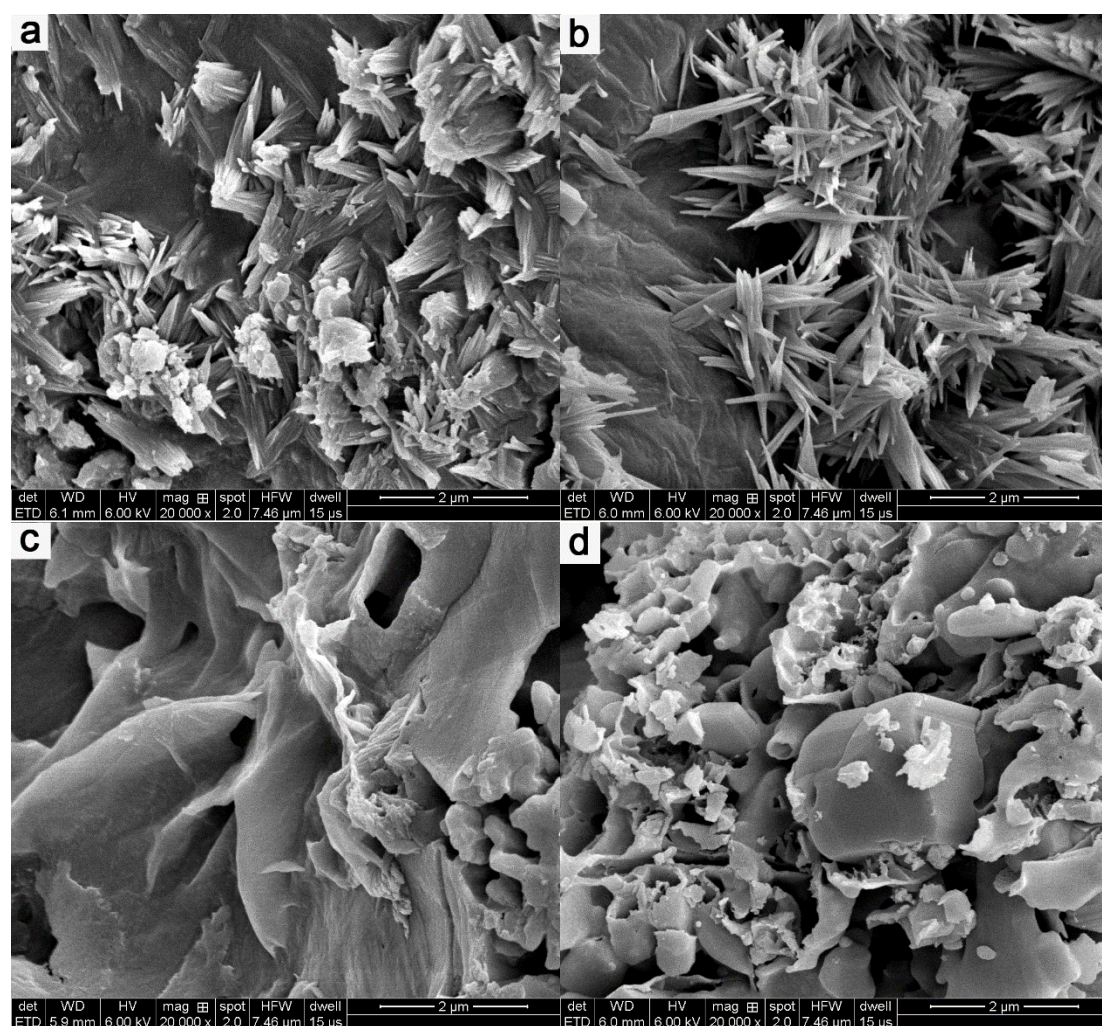


Figure S1 SEM images of biomass-derived CQDs of different pyrolysis temperature: (a)CQD300; (b) CQD350; (c) CQD400; (d) CQD500.

2. TEM and HRTEM analysis of CQDs

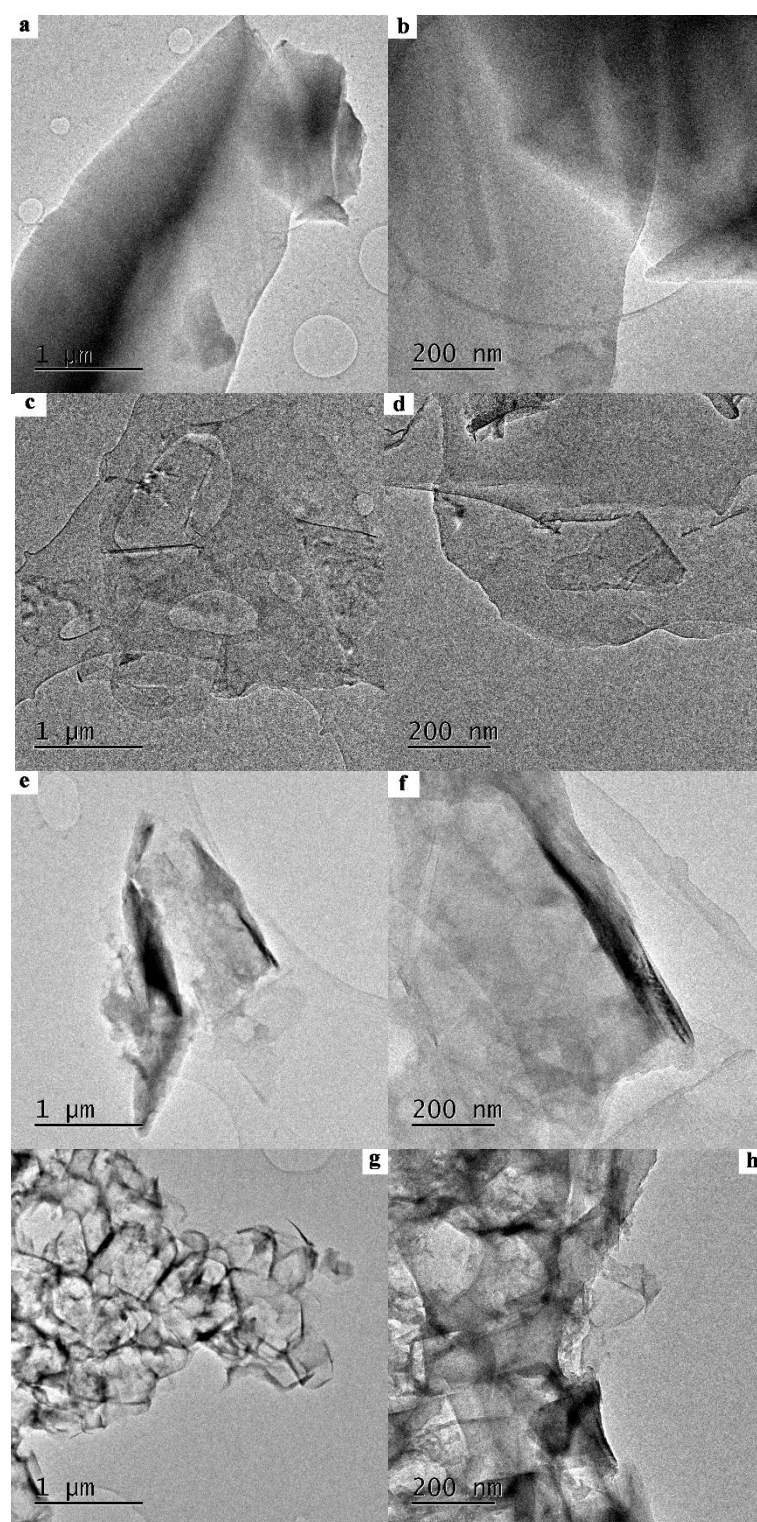


Figure S2. TEM and HRTEM images of the (a), (b) CQD300; (c), (d)CQD350; (e), (f) CQD400; (g),(h)CQD500.

3. Determination of Oil–Water Interfacial Tension

The water phase was a soap containing CQDs water solution, with a concentration of 0.5g/10ml. The IFT between water and oil (styrene) were determined by spinning drop method at 50 °C, and 6000 rpm. The IFT values used herein are equilibrium IFTs obtained when the shape of oil drop could not be changed over time.

4. Fluorescent image of CQD400/styrene nanocopmosites

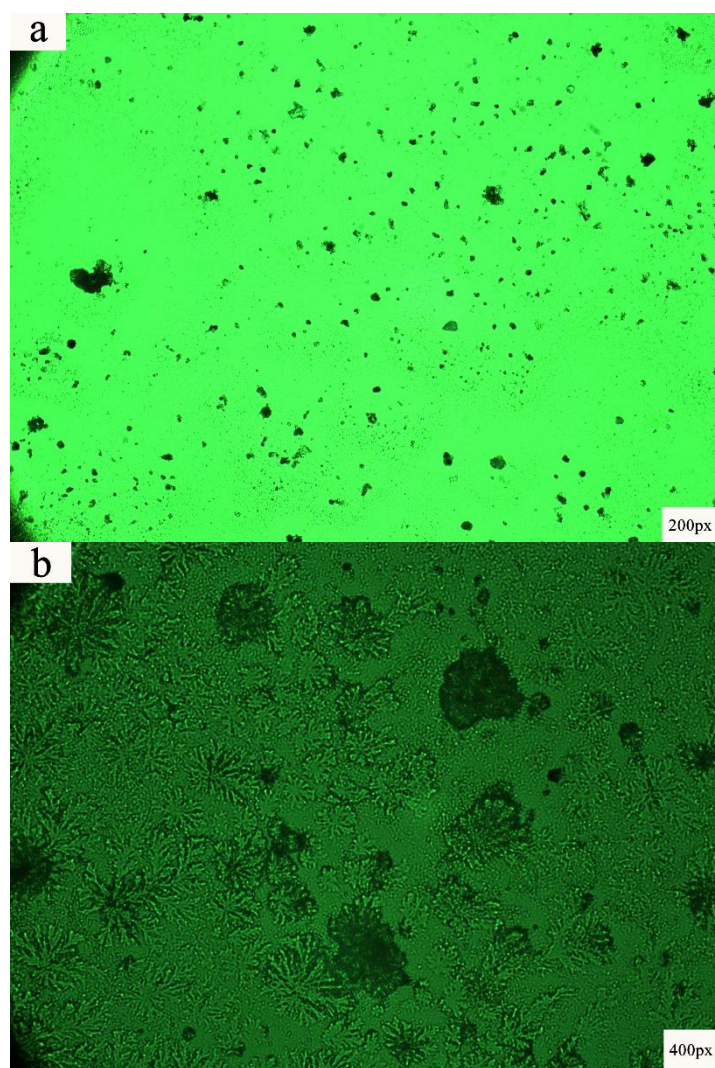


Figure S3 Fluorescent image of CQD400/styrene nanocopmosites at (a) 200px; (b) 400px.

5. XRD analysis of CQDs

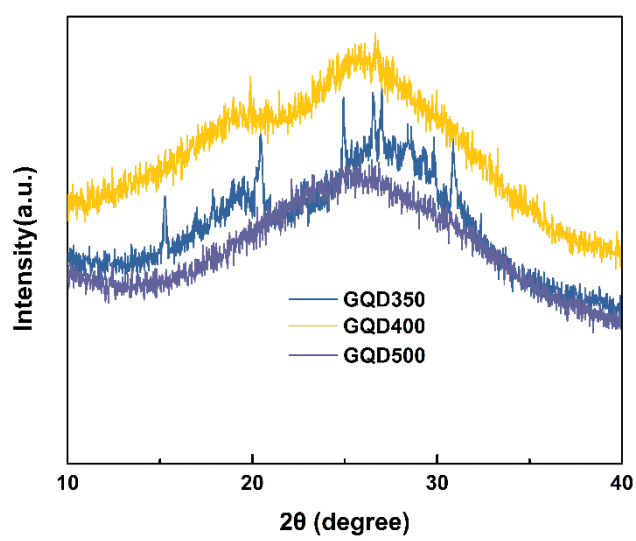


Figure S3 XRD spectra of CQDs