Supplementary Material (ESI) for Chemical Communications

Electrochemical Synthesis of SnO_2 Films Containing Three-Dimensionally Organized Uniform Mesopores via Interfacial Surfactant Templating

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Supporting Information

Experimental

Stainless steel foils or Pt films (1.4 cm x 1.8 cm) were used as the working electrode, and an Ag/AgCl electrode in 4M KCl solution was used as the reference electrode. The Pt films used as the counter and the working electrode were prepared by evaporating 10 nm of titanium followed by 50 nm of platinum on clean glass slides using an E-beam evaporator. The cathodic electrodeposition of SnO_2 films was achieved potentiostatically at –0.25 V (current density = 0.54 mA/cm^2) at 45 ºC without stirring. The optimum SDS content to ensure a homogeneous mesostructure construction was found to be 2 wt %. No apparent advantage was observed when the amount of SDS exceeds 2 wt %.

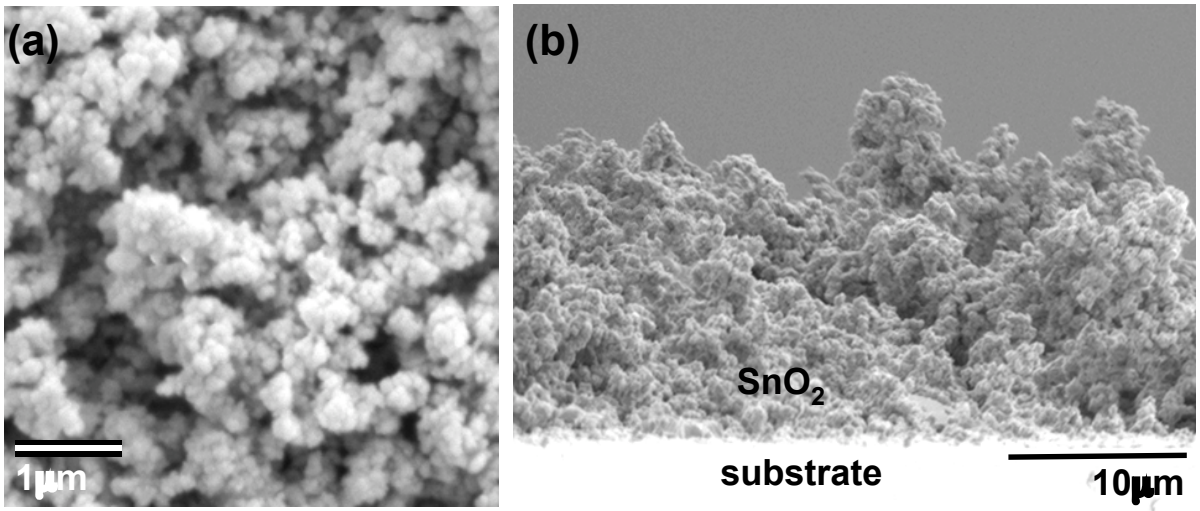

Figure 1S. SEM images of (a) top and (b) side view of mesoporous SnO_2 Films.

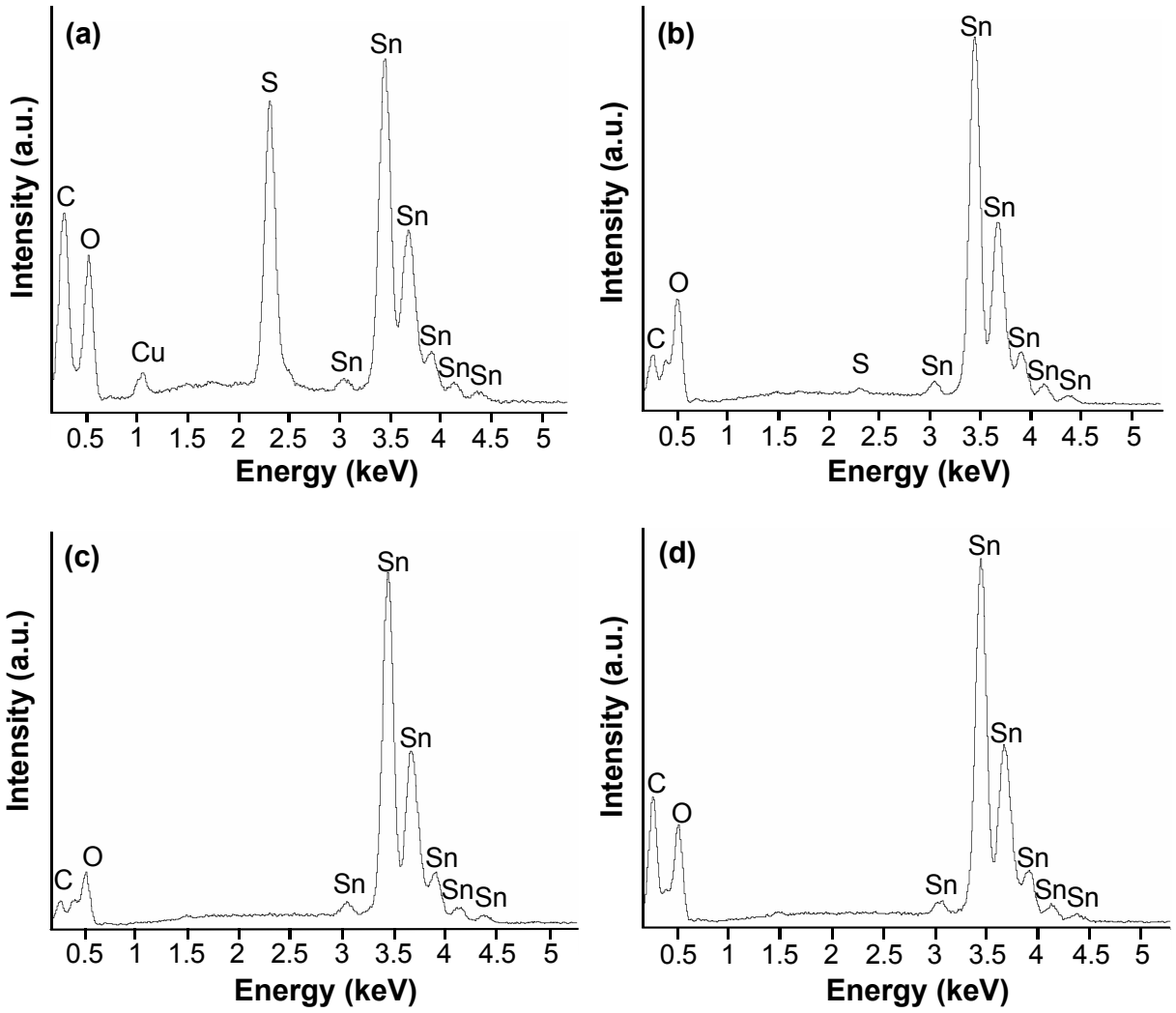

Figure 2S. Energy Dispersive X-ray Spectra of SnO_2 films deposited with 2 wt % SDS; (a) as-deposited after 30 s of rinsing, (b) after 6 hours of soaking in deionized (DI) water, (c) after 9 hours of soaking in DI water, and (d) after 6 hours of soaking with gentle stirring. The quantity of light elements such as oxygen and carbon assessed by EDS is not reliable, but the ratio of sulfur to tin can be used to estimate the amount of SDS present in SnO_2 films. Note the disappearance of the sulfur peak in samples (c) and (d) due to removal of SDS. The copper peak shown in sample (a) originated from the copper tape used for sample preparation for EDS.

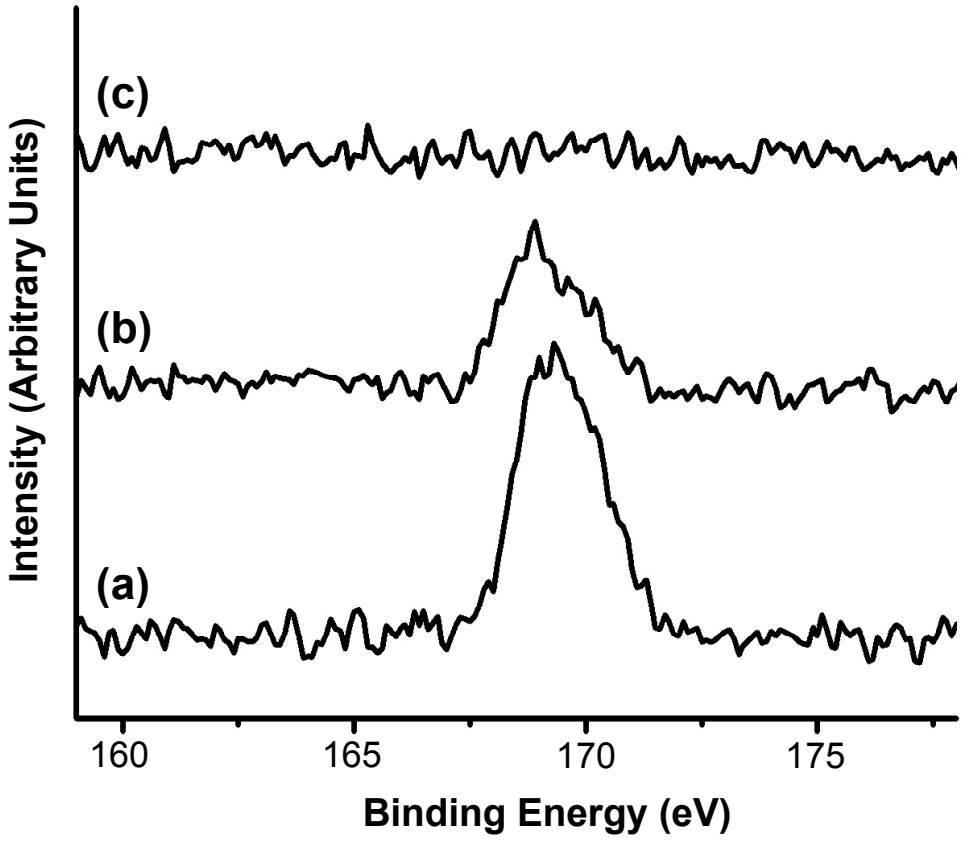

Figure 3S. Sulfur 2p X-ray photoelectron spectra for SnO_2 films deposited with 2 w % SDS; (a) as-deposited after 30 s of rinsing, (b) after 3 hours of soaking in DI water, and (c) after 12 hours of soaking in DI water. Note the disappearance of the sulfur peak in sample (c) due to removal of SDS.