Supplementary Material (ESI) for Chemical Communications

Template directed synthesis of mesoporous ZnO having high porosity and optoelectronic properties

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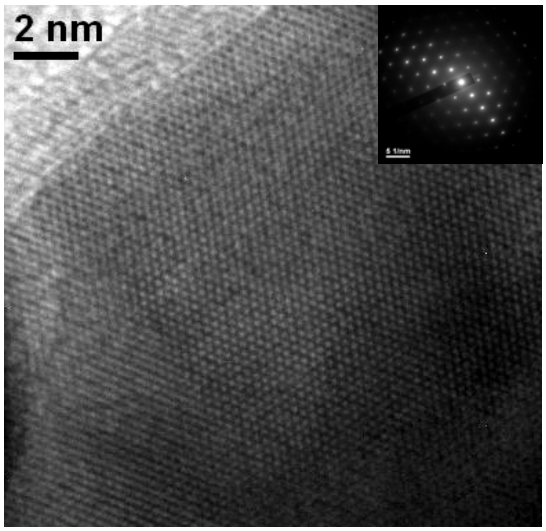
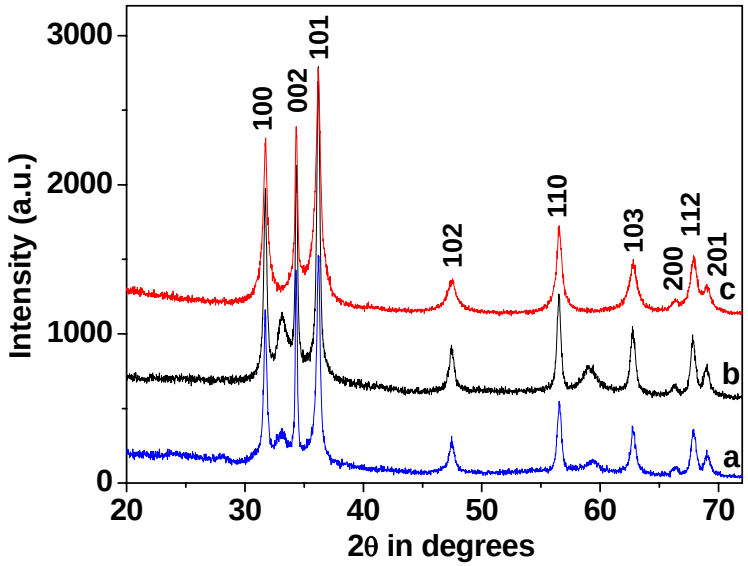
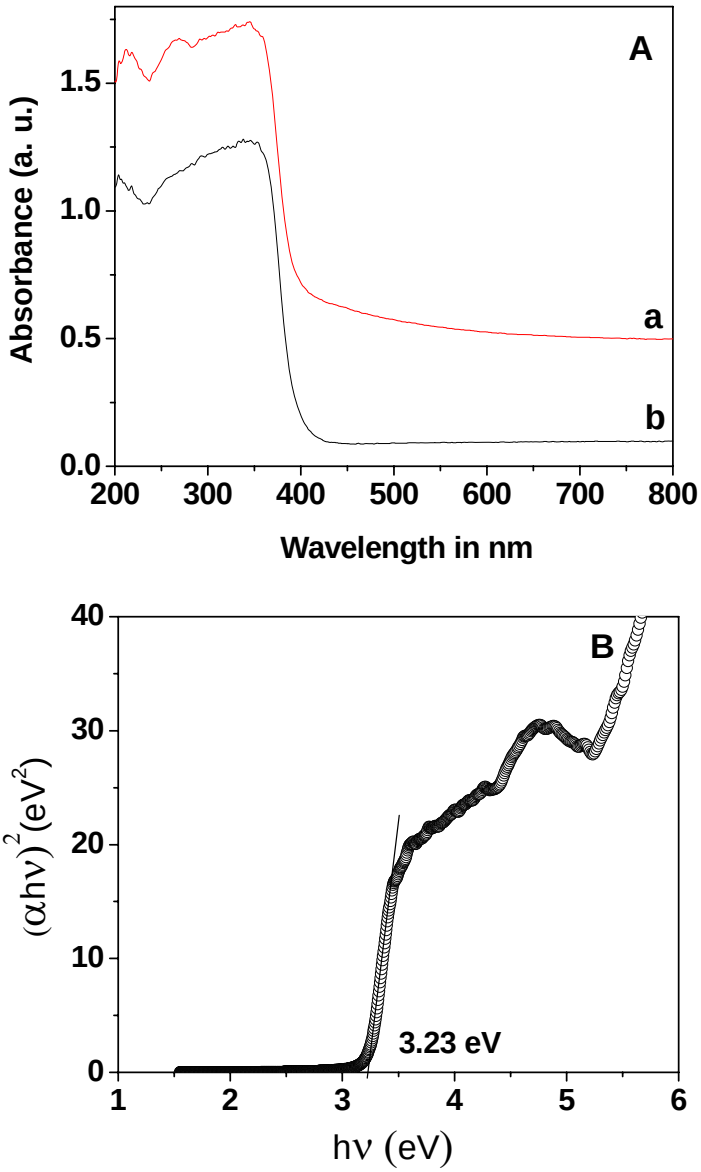
Supplementary Information



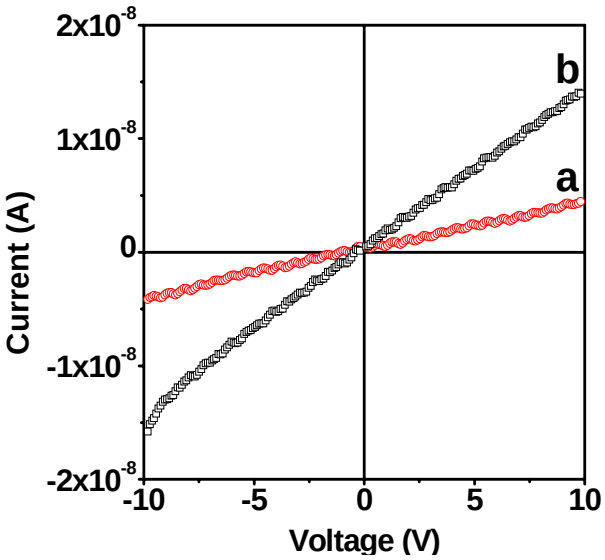
S1: Transmission electron micrograph of bulk ZnO (sample 2). Respective electron diffraction patterns are shown in the inset suggesting hexagonal lattice.



S2: Wide angle XRD pattern of as-synthesized (a) and template-free (b) sample 1 and bulk ZnO (sample 2, c). As synthesized sample showed impurity $Zn(OH)_2$ phase along with ZnO, whereas when mesoporous ZnO (sample 1) and nonporous ZnO (sample 2) materials are heated at 418 K it transforms completely into nanocrystalline ZnO.



S3: A: UV-vis diffuse reflectance spectra of SDA-free mesoporous ZnO (sample1, a) bulk ZnO (sample 2, b). B: Direct band gap calculated from absorbance value for mesoporous ZnO.



S4: Current-voltage (I-V) characteristics of the mesoporous ZnO (sample 1, a) bulk ZnO (sample 2, b). For electrical measurements, first a pellet (8 mm diameter) was prepared using a pelletizer under a pressure of 7 tonnes/cm^2 from 0.4 g of powder of each samples. For the purpose of D. C. current measurements, gold metal (Sigma-Aldrich, 99.99%) electrodes were deposited in circular form of diameter 2 mm on the surfaces of the pellets. The dark current-voltage (I-V) measurements were done by keeping the sample in dark for several hours and measuring the D.C. current between the two contacts using Keithley source meter (model: 2400).