Supporting Information

Outward Conversion of Core-Shell Nanostructured ZnS Microspheres to Mesoporous ZnO Ones

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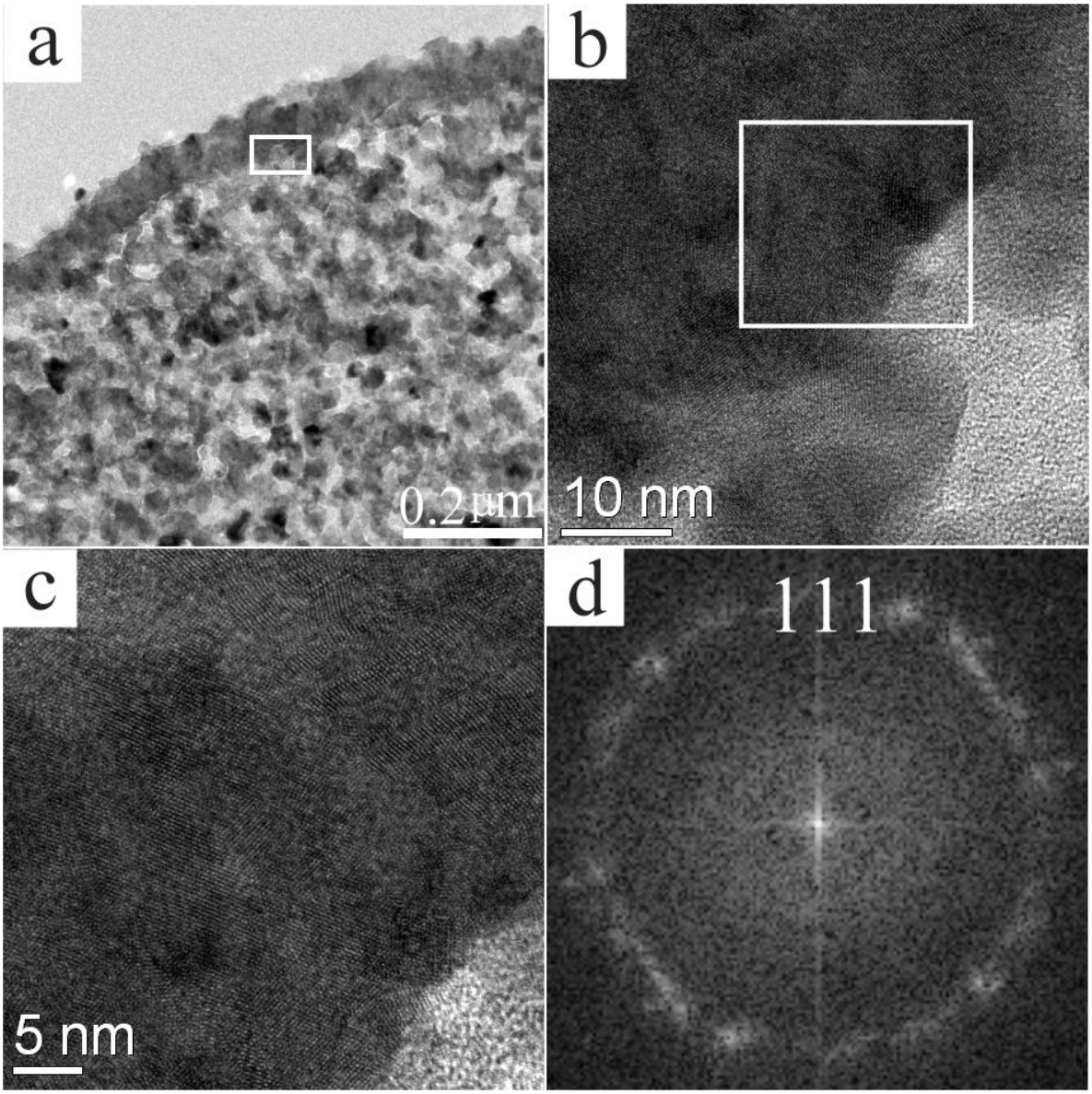

Figure S1. (a) A TEM image of the typical Zn(S,O)@ZnS core-shell product, (b) high-magnification TEM image from the rectangle in (a), (c) high resolution TEM image from (b) indicating rich defects, (d) corresponding FFT pattern of (c), indicating the shell is sphalerite ZnS.

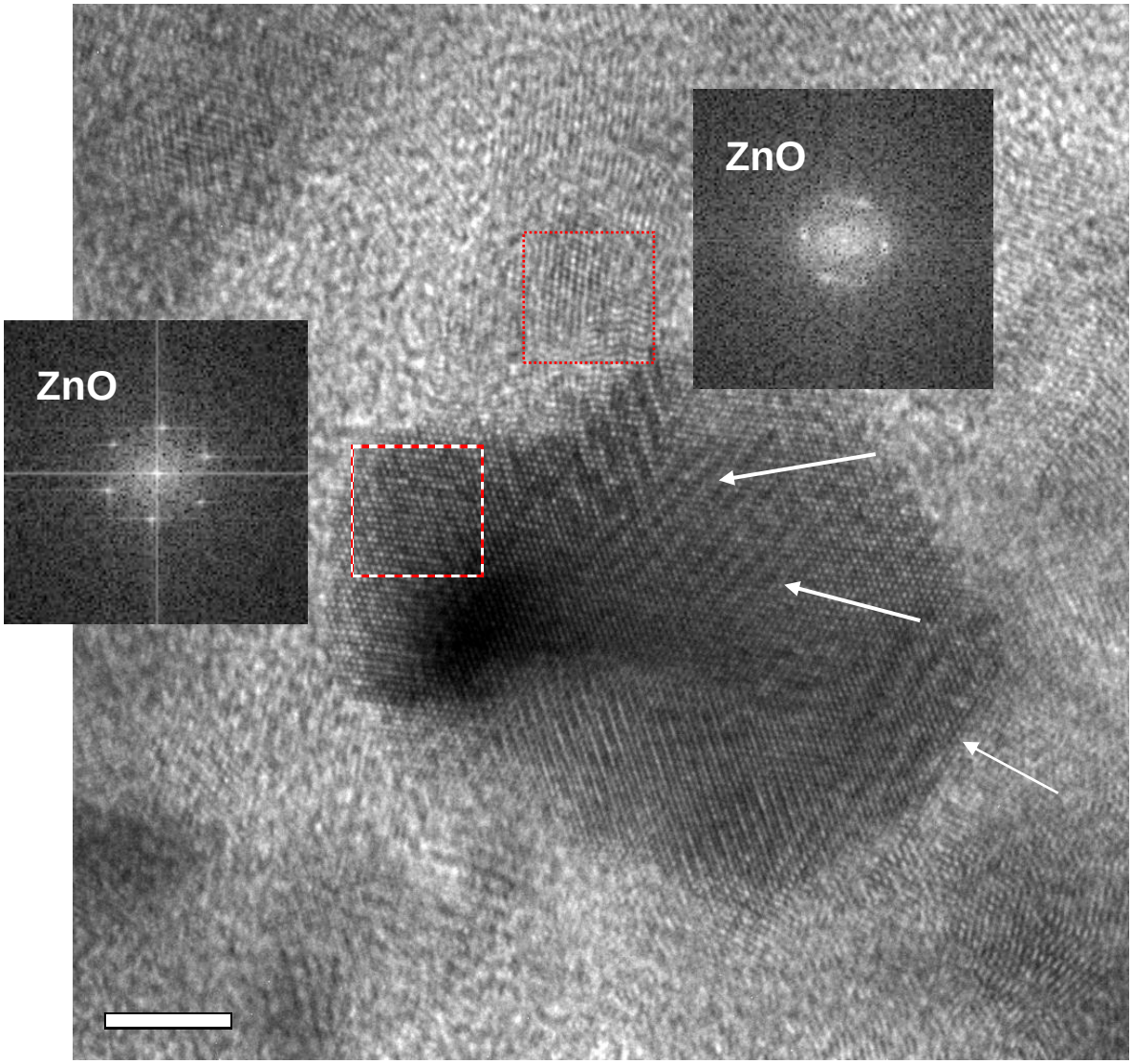

Figure S2. The presence of ZnO nanocrystals with size of ca. 5 nm on the surface of a nanoparticle inside the core. There are Moriefringes which might results from mismatched overlap of ZnS and ZnO lattice. The mismatch is about 10 % between ZnS (111) and ZnO (10-10).

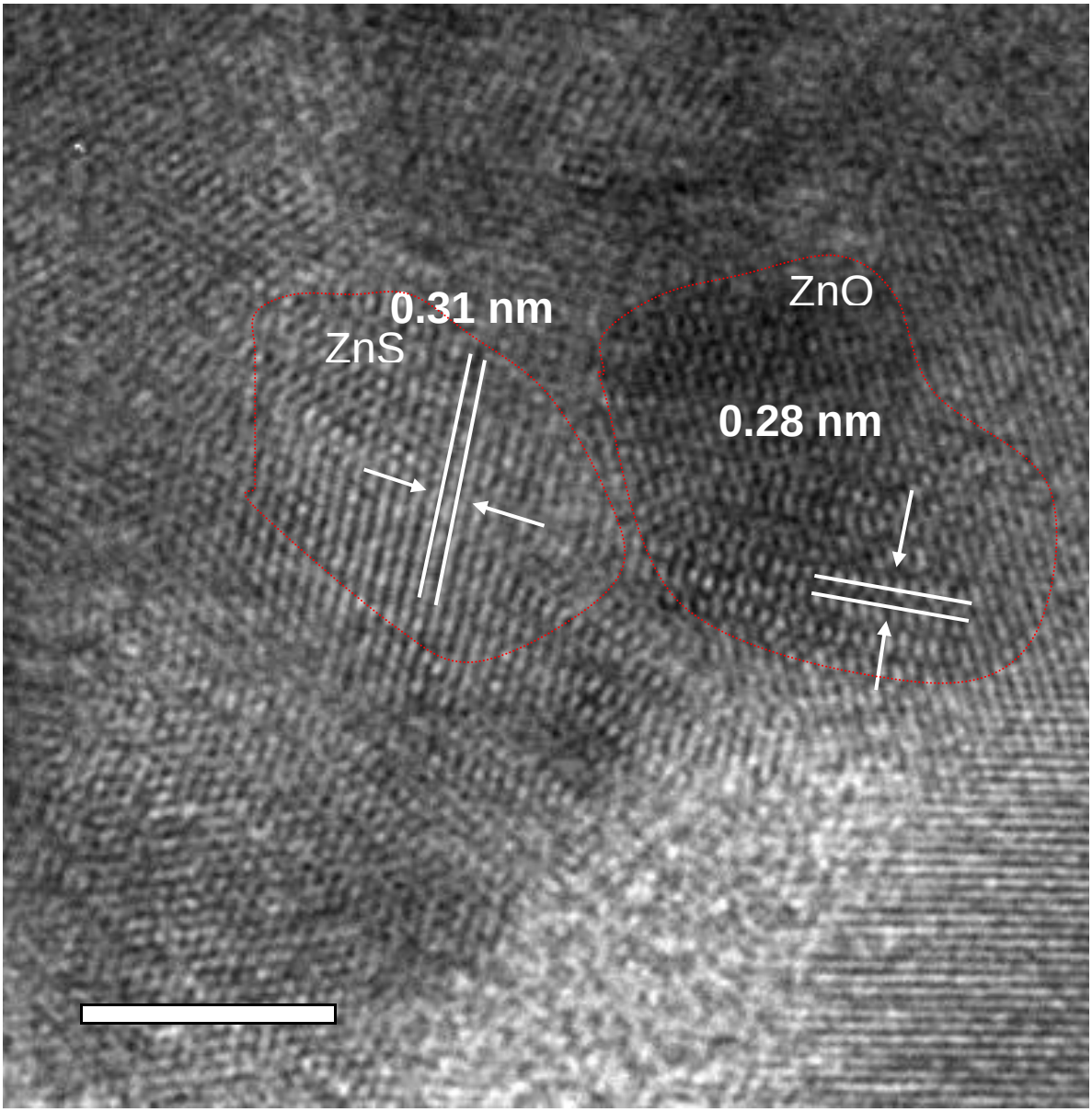

Figure S3. An enlarged HR-TEM image to clearly show lattice fringes of ZnS and ZnO respectively.

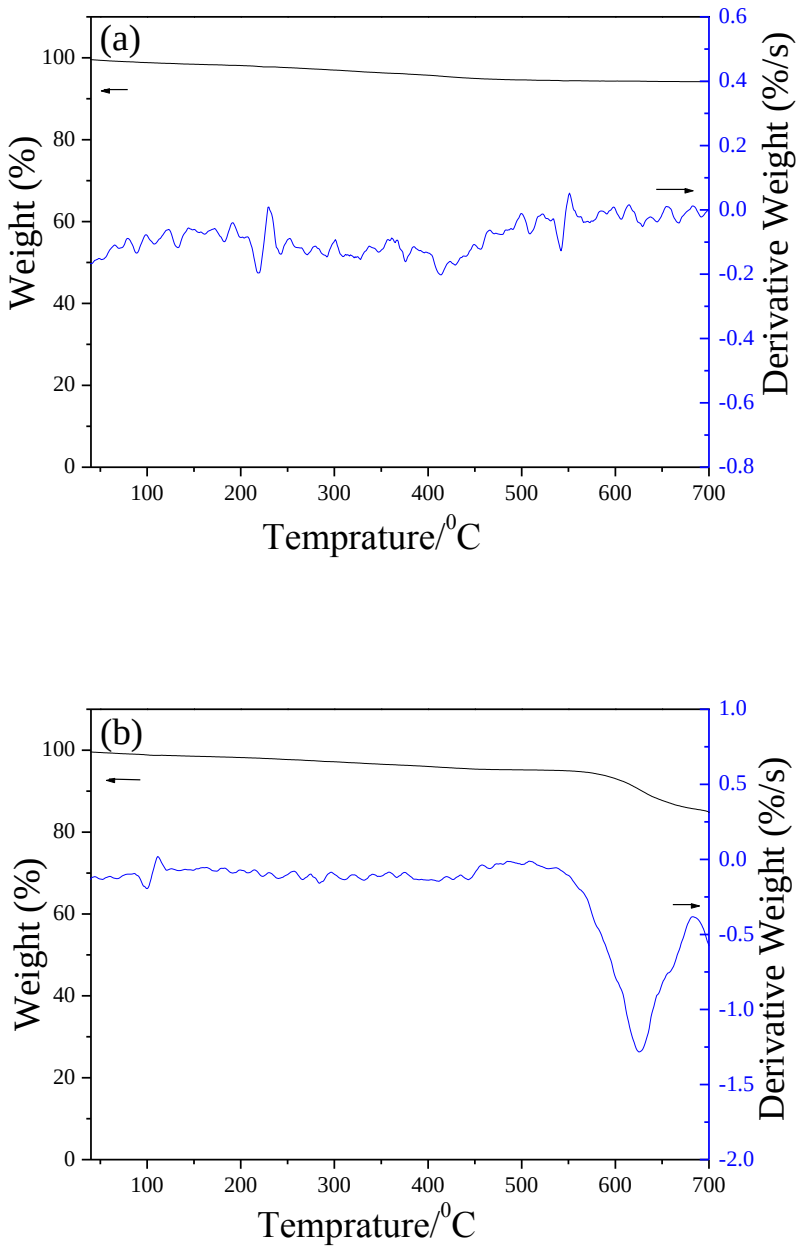

Figure S4. TG-DTG analyses of ZnS samples annealing under different conditions: (a) in N_2 flow and (b) in air flow.

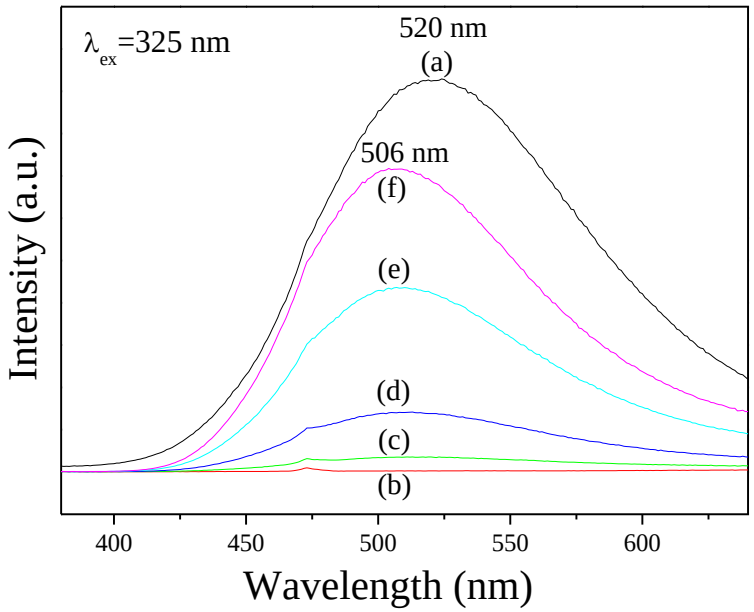

Figure S5. Room-temperature photoluminescence spectra of (a) the pristine ZnS sample and the products after its thermal treatment in air for (b) 1.0, (c) 4.0, (d) 8.0, (e) 12.0 hrs, and (f) 48 hrs, respectively.