Electronic Supplementary Material (ESI) for RSC Advances

Supporting Information

A General Approach for Synthesis of Functional Metal Oxide Nanotubes and their Application in Dye-sensitized Solar Cells

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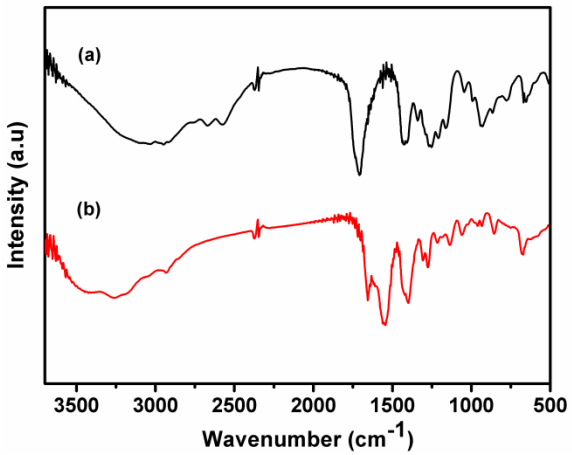

Fig. S1 FT- IR spectra of (a) MPA and (b) Se NWs functionalized with Mercaptopropionic acid.

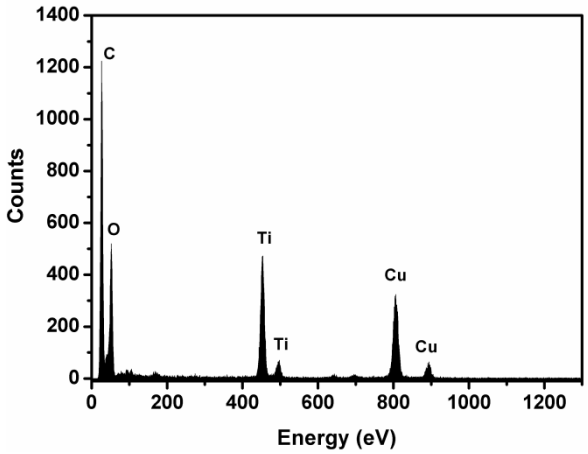

Fig. S2 EDS spectrum of TiO_2 nanotubes.

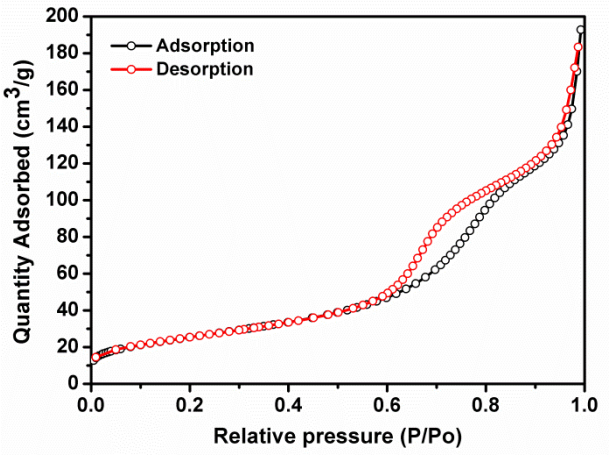

Fig. S3 Nitrogen adsorption-desorption isotherms of TiO_2 nanotubes.

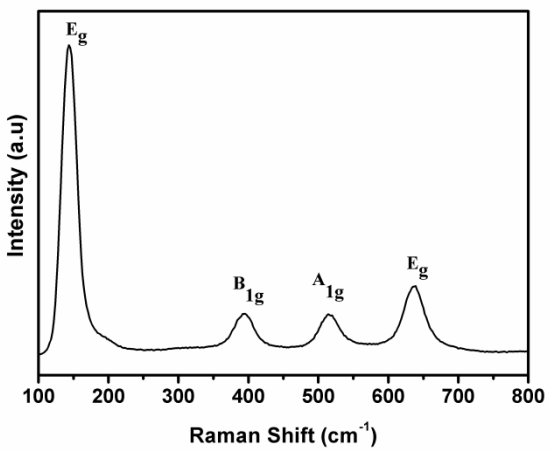

Fig. S4 Raman spectrum of TiO_2 nanotubes. The major Raman peaks observed at 144, 394, 516 and 637 cm^{-1} can be attributed to E_g, B_{1g}, A_{1g} and E_g modes of anatase TiO_2. It is well known that the E_g peak is mainly due to symmetric stretching vibration of O-Ti-O, the B_{1g} peak is caused by symmetric bending vibration of O-Ti-O, and the A_{1g} peak is corresponds to anti-symmetric bending vibration of O-Ti-O in TiO_2.

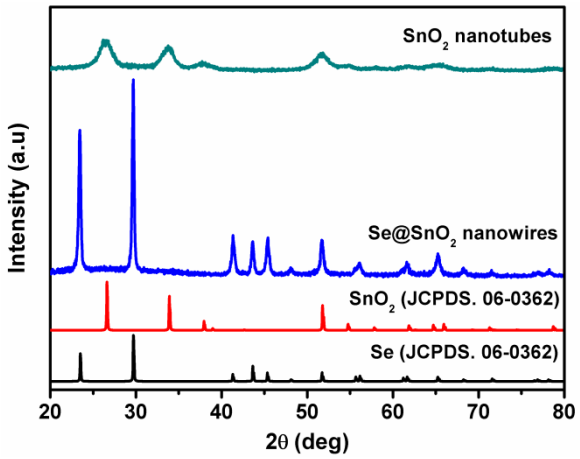

Fig. S5. XRD patterns of Se@SnO_2 core-shell nanowires and SnO_2 nanotubes.

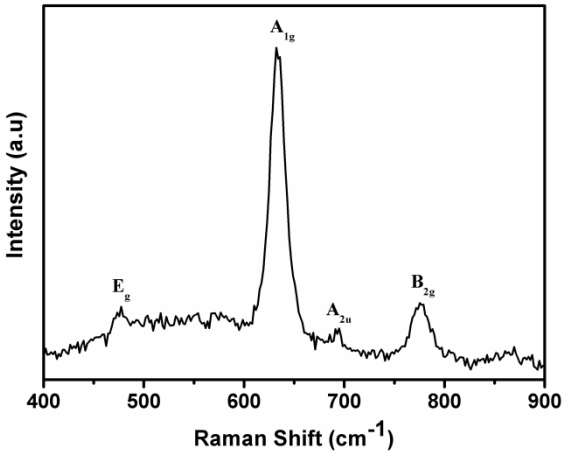

Fig. S6 Room-temperature Raman spectrum of SnO_2 nanotubes. The Raman scattering peaks at 475, 632, and 775 cm^{-1} correspond to the E_g, A_{1g}, and B_{2g} vibrational modes, respectively. Thus, these Raman peaks further confirmed the tetragonal rutile structure of the as-synthesized SnO_2 nanotubes. The Raman peak at 694 cm^{-1} can be assigned to the IR-active LO A_{2u} mode of SnO_2.

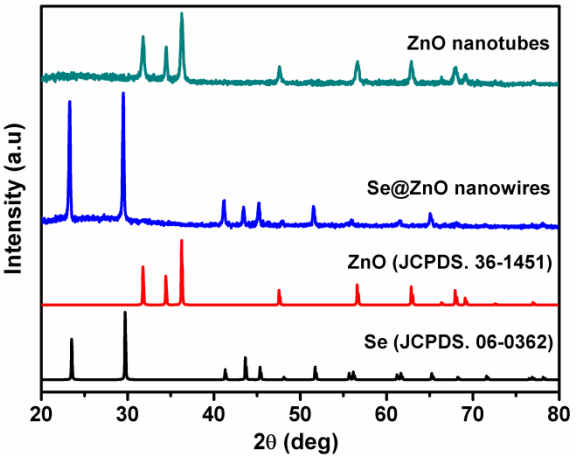

Fig. S7 XRD patterns of Se@ZnO core-shell nanowires and ZnO nanotubes.

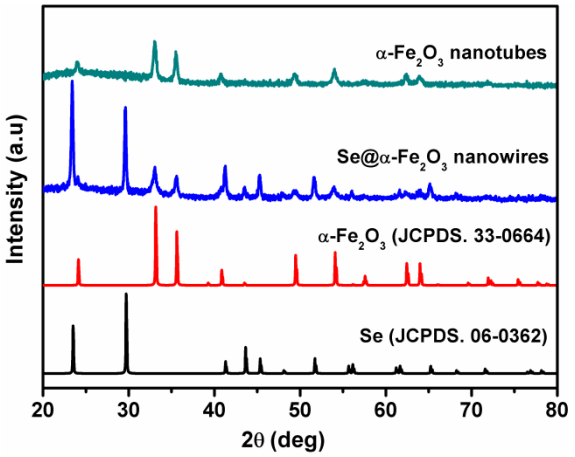

Fig. S8 XRD patterns of Se@Fe_2O_3 core-shell nanowires and Fe_2O_3 nanotubes.

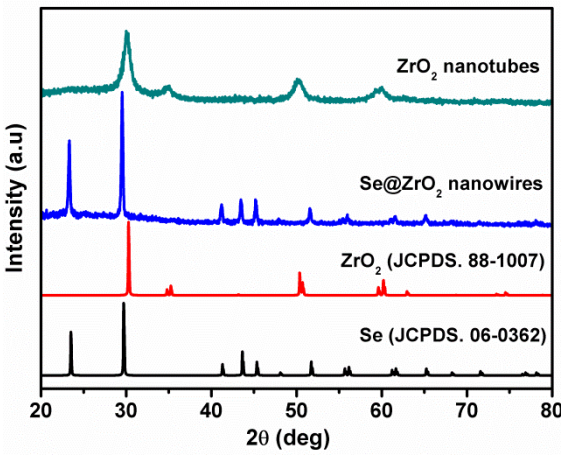

Fig. S9 XRD patterns of Se@ZrO_2 core-shell nanowires and ZrO_2 nanotubes.