Electronic supplementary information (ESI):

Nanoscale semiconductor-insulator-metal core/shell heterostructures: facile synthesis and light emission

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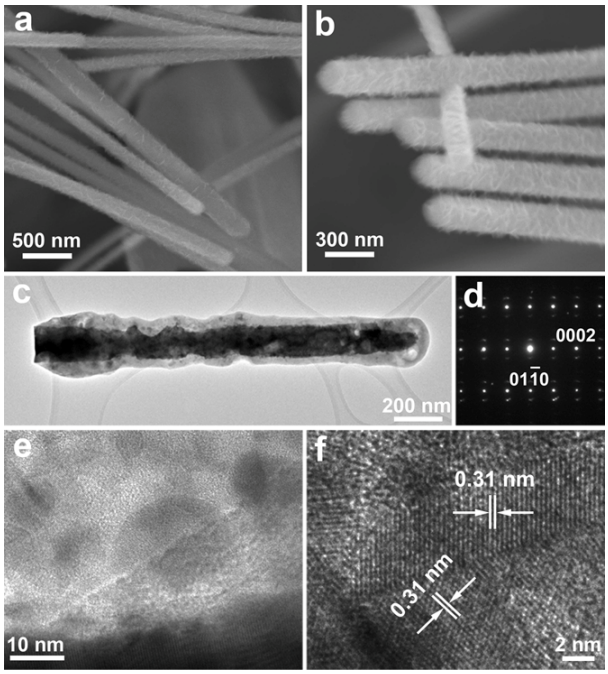

Figure S1. (a) and (b) SEM image of 700 °C annealed ZnO/MgO core/shell NWs. (c) Corresponding low-resolution TEM image of a ZnO/MgO core/shell NW and (d) the SAED pattern. (e) TEM image of the interface showing that MgO layer is polycrystalline and composed of randomly oriented MgO nanocrystals with sizes ranging from 5 to 15 nm. (f) High-resolution TEM image of the MgO shell. The measured interplanar spacing of 0.31 nm matches well with the (511) planes of cubic MgO, indicating that the amorphous MgO is crystallized into MgO nanocrystals during the high temperature annealing.

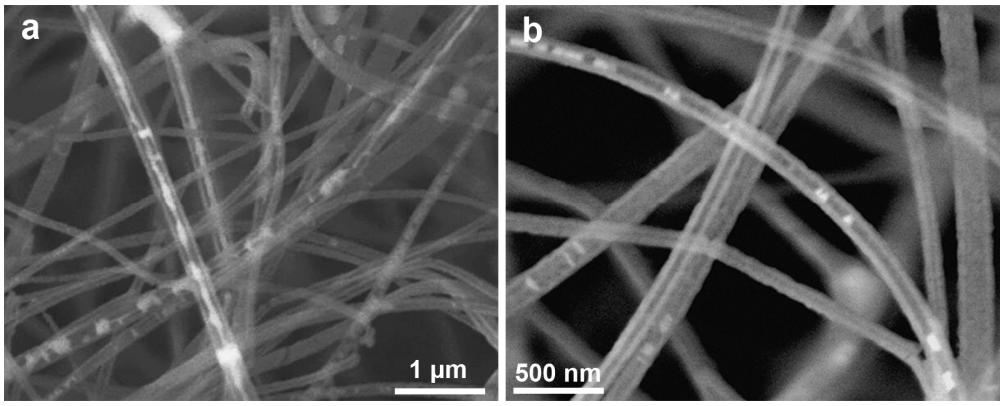

Figure S2. SEM image of linear SnO_2 NPs embedded in MgO NTs formed by annealing SnO_2/MgO NWs in H_2 (10% in Ar) at 1000 °C for 1 h.

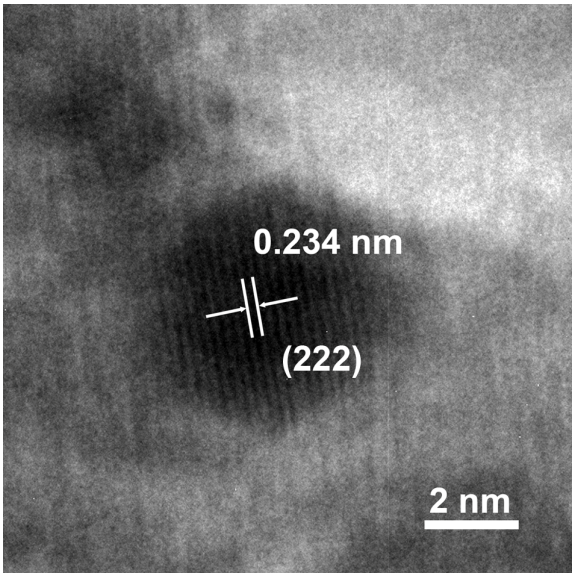

Figure S3. High-resolution TEM image of an individual MgO nanocrystal inside the MgO NTs obtained by dry etching (10%H_2 at 750 °C for 1 h).

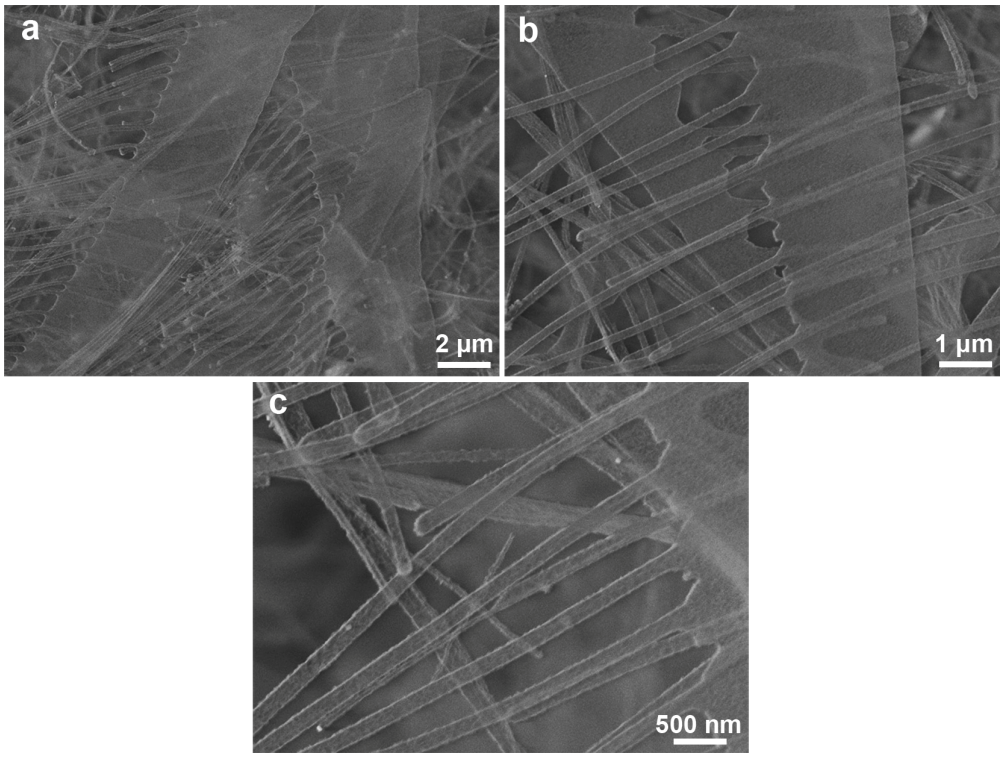

Figure S4. SEM images of comb-shaped hollow MgO nanostructures formed by post-annealing ZnO nanocomb/ MgO heterostructures in H_2 (10% in Ar) at 750 °C for 1 h.