

Supporting information for

# Gas-Phase Anion Exchange towards ZnO/ZnSe Coaxial Nanorods with Intensive Visible Light Emission

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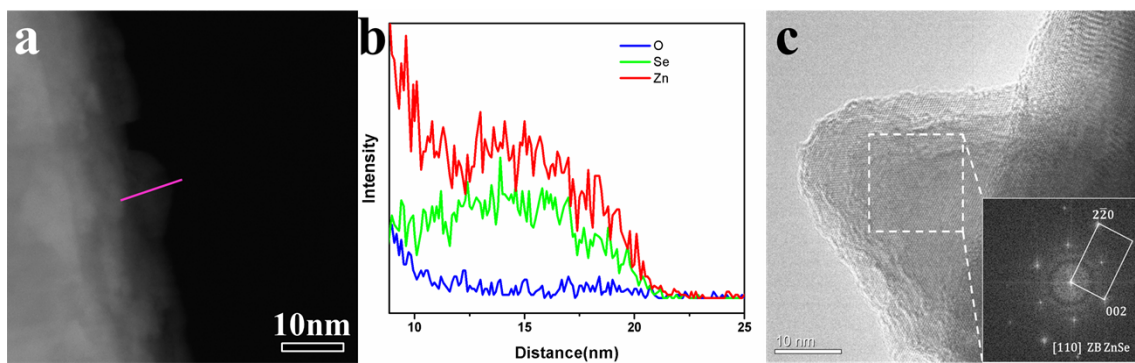
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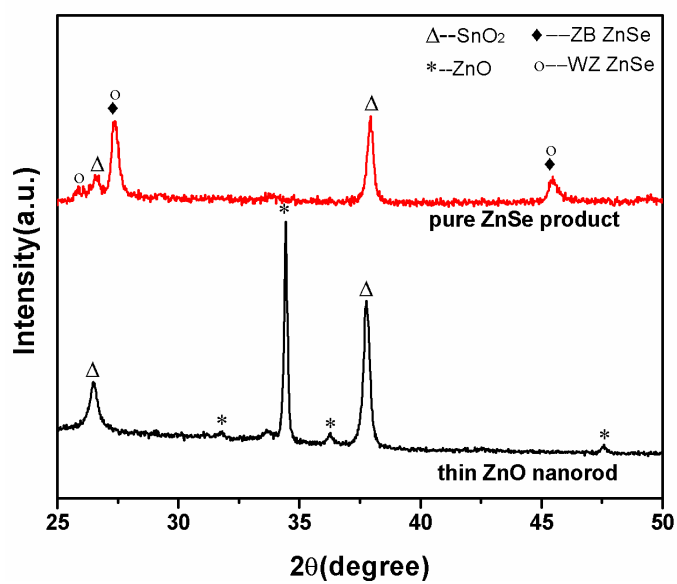
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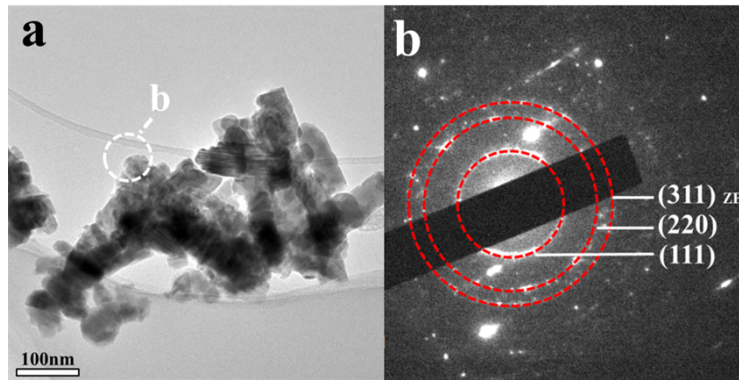
E-mail: xwdu@tju.edu.cn



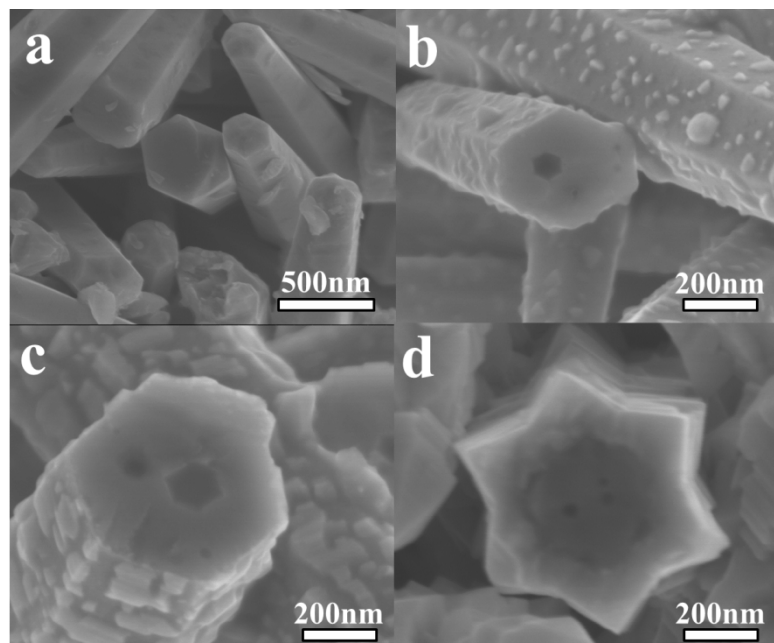
**Figure S1** (a) Scanning transmission electron microscope (STEM) image of nanoparticles formed on a ZnO nanorod after being heated to 600 °C without holding temperature. (b) Elemental linescan analysis across a nanoparticle along the line shown in (a); (c) HRTEM image of a nanoparticle on the ZnO/ZnSe nanorod, the inset is a FFT pattern corresponding to the area in the white frame.



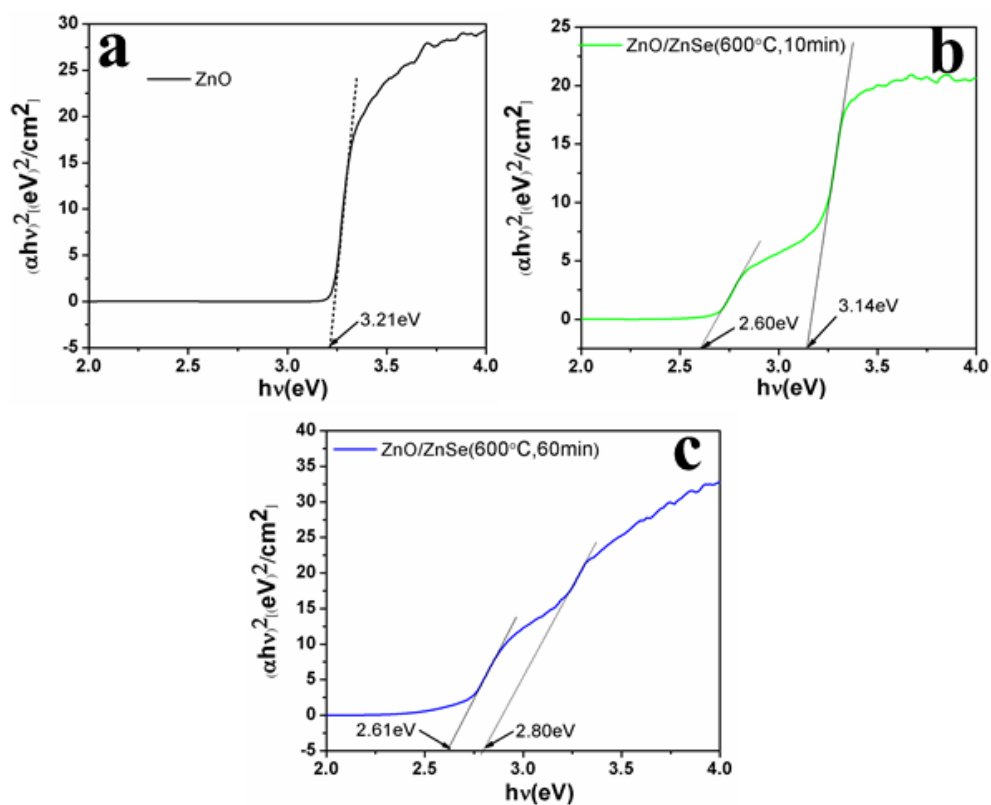
**Figure S2** XRD patterns of the thin ZnO nanorods before anion exchange and corresponding pure ZnSe nanorods after anion exchange.



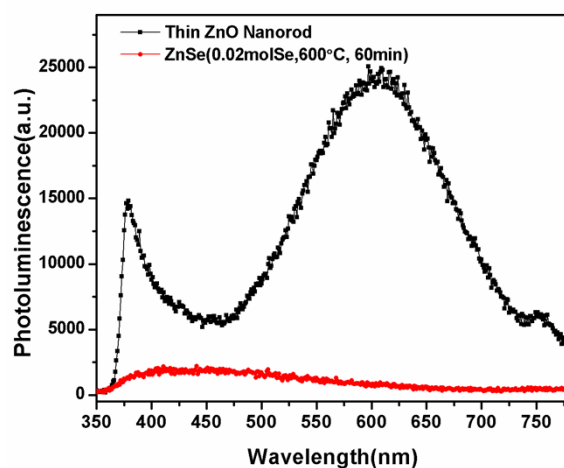
**Figure S3** (a) TEM image of the selenylation product by using thin ZnO nanorods as template; (b) SAED pattern of the agglomerated particles marked in (a).



**Figure S4** Cross-sectional SEM images of (a) raw ZnO nanorod; (b) the sample heated to 600 °C without holding temperature; (c) the sample being kept temperature at 600 °C for 10 min; (d) the sample being kept temperature at 600 °C for 60 min.



**Figure S5** The  $(\alpha h\nu)^2$ - $h\nu$  plot of the absorption spectra shown in Figure 5a. (a) pure ZnO nanorods, (b) ZnO/ZnSe nanorods after 10 min anion exchange, (c) ZnO/ZnSe nanorods after 60 min anion exchange.



**Figure S6** PL spectra of the raw thin ZnO nanorods and product after selenization. The PL spectra were acquired at an excitation wavelength of 325 nm.