Supporting Information

Atomic Sulfur Passivation Improves the Photoelectrochemical Performance of ZnSe Nanorods

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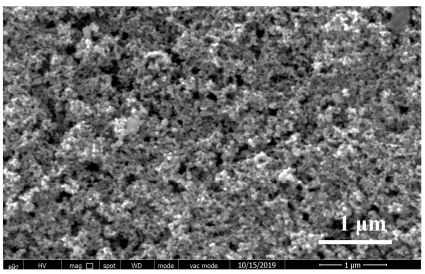

Figure S1. SEM image of the mesoporous TiO_2/ZnSe NRs photoanode.

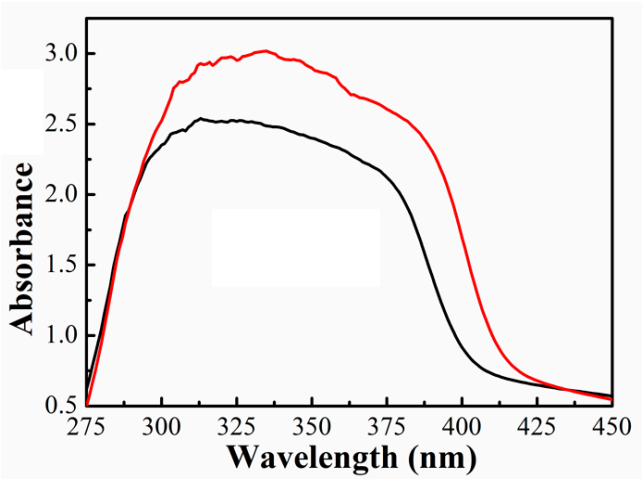

Figure S2. UV-vis absorption spectra of the TiO_2 photoanode (black) and the TiO_2/ZnSe NRs photoanode without applying sulfur passivation (red).

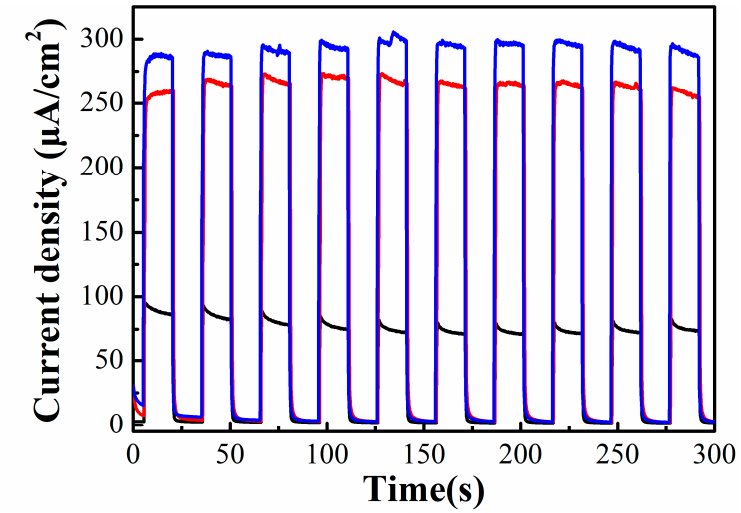

Figure S3. Transient photocurrent density of the TiO_2 photoanode (black), and the TiO_2/ZnSe NRs photoanodes with an atomic sulfur passivation for 2 min (red) and 7 min (blue).

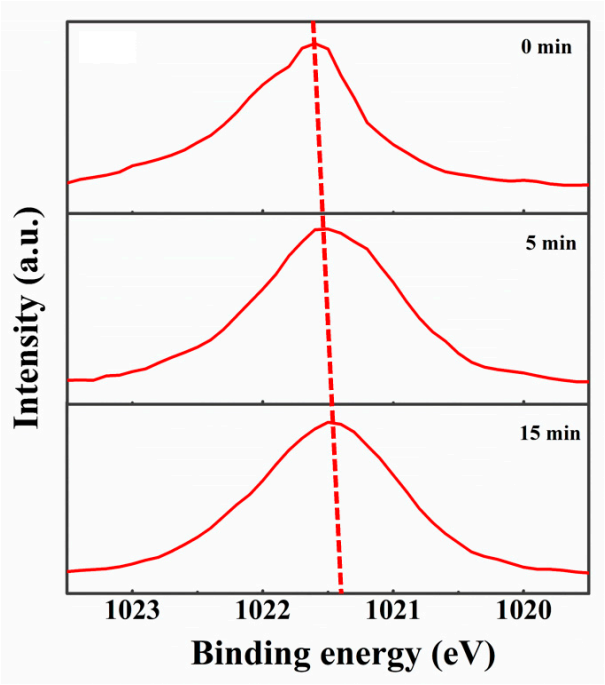

Figure S4. Zn 2p XPS spectra of TiO_2/ZnSe NRs photoanodes with atomic sulfur passivation for 0, 5, and 15 min.

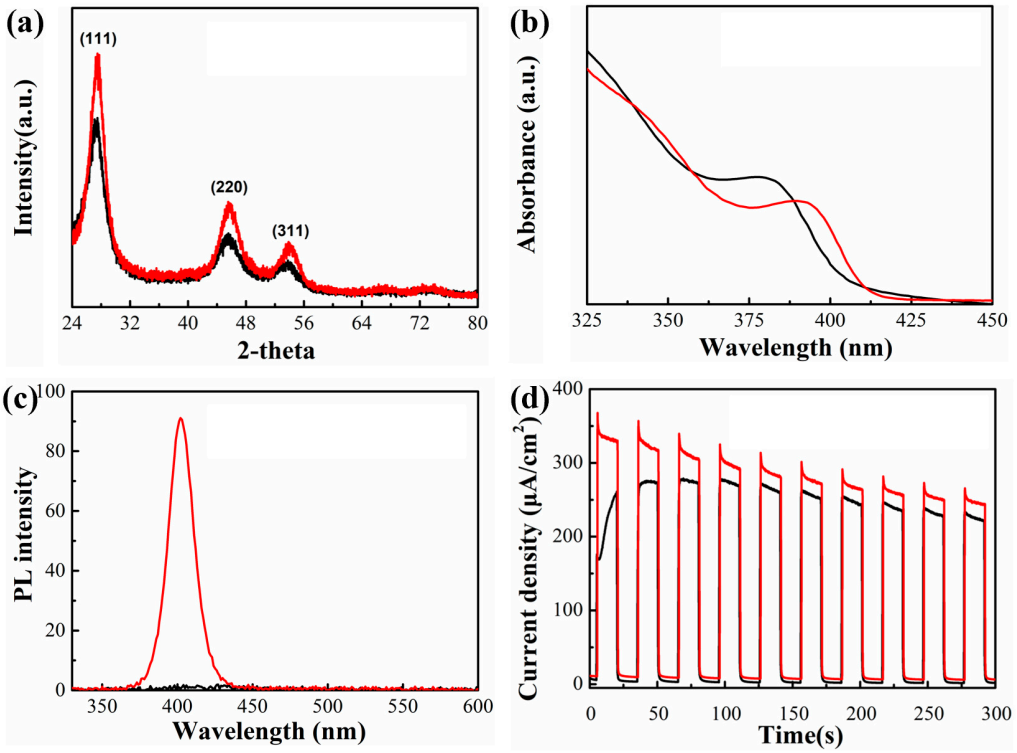

Figure S5. (**a**) XRD patterns, (**b**) UV-vis absorption spectra, and (**c**) PL spectra of ZnSe NRs (black) and ZnSe/ZnS core/shell NRs (red). (**d**) Transient photocurrent density of TiO_2 photoanodes modified with ZnSe NRs (black) and ZnSe/ZnS core/shell NRs (red).

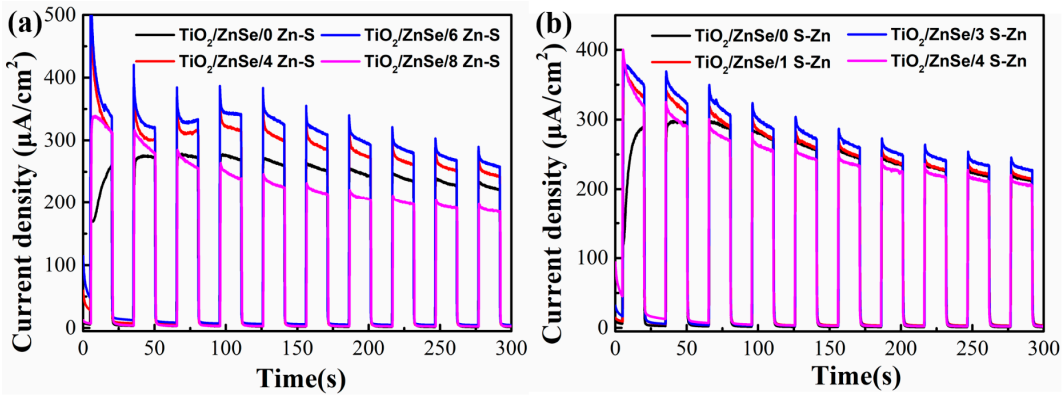

Figure S6. Transient photocurrent density of the TiO_2/ZnSe NR-based photoanodes coated with ZnS passivation layers with different thickness and deposition sequence, (**a**) from Zn^{2+} to S^{2-} and (**b**) from S^{2-} to Zn^{2+} using successive ionic layer adsorption and reaction (SILAR) method.