Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supplementary Information

ITO nanoparticles film as hole-selective layer for PbS sensitized photocathode

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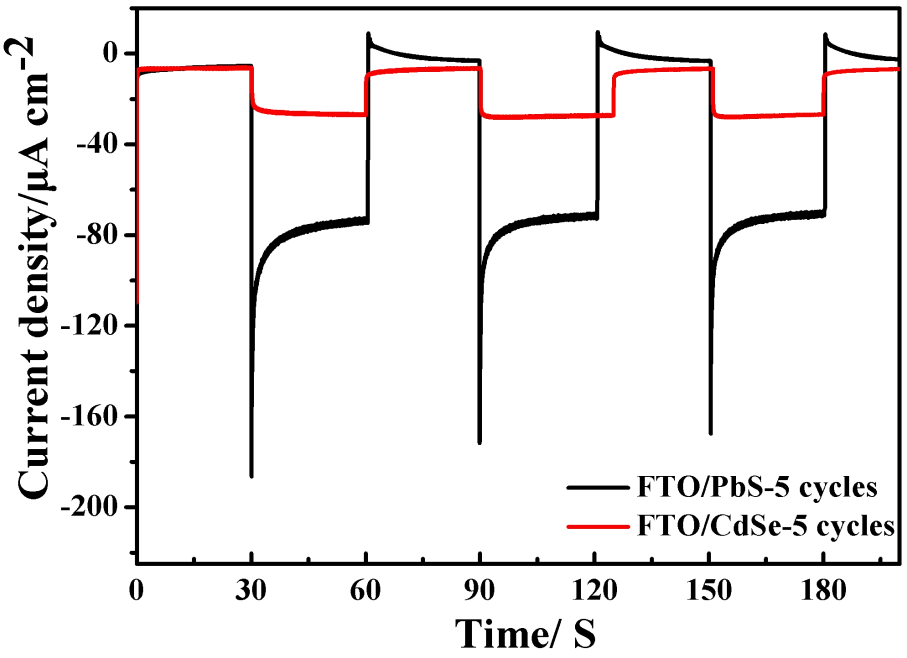

Figure S1. The transient photocurrent responses to on-off illumination of the FTO/ITO CdSe and FTO/ITO/PbS electrode.

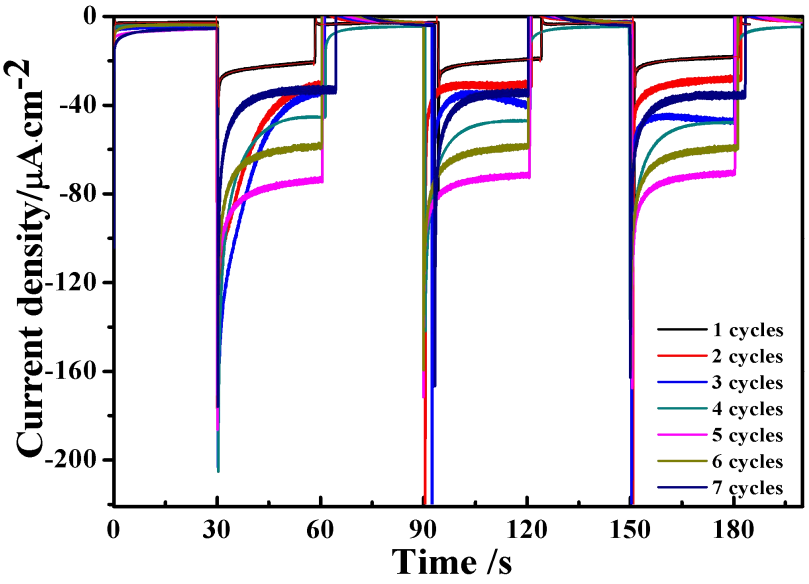

Figure S2. Photoelectrochemical response (chronoamperometry) of FTO/ITO/PbS electrode after different SILAR deposition of PbS (1-7 cycles) under 300 W Xe-lamp illumination (~100 mW cm^{-2}) with a 400 nm filter in air saturated 0.5 M Na_2SO_4 solution at -0.222 V vs Ag/AgCl.

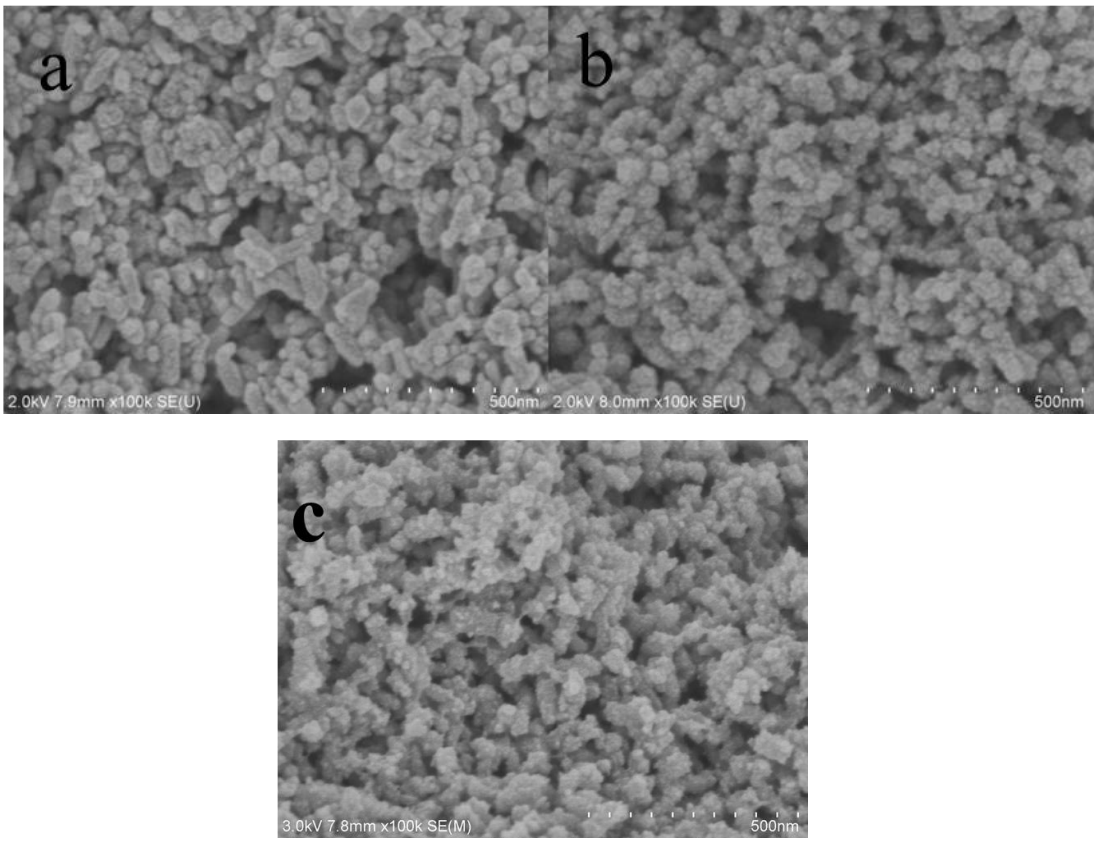

Figure S3. SEM images of FTO/ITO sample (a), FTO/ITO/PbS sample (b) and FTO/ITO/CdSe (c) sample.

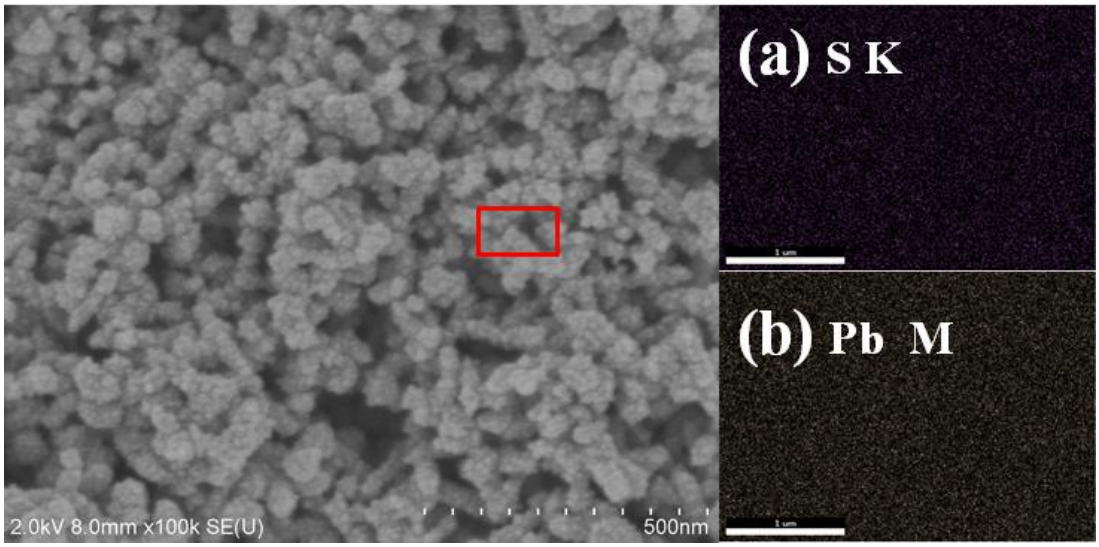

Figure S4. the top-view STEM-EDS elemental maps for a) S and b) Pb.

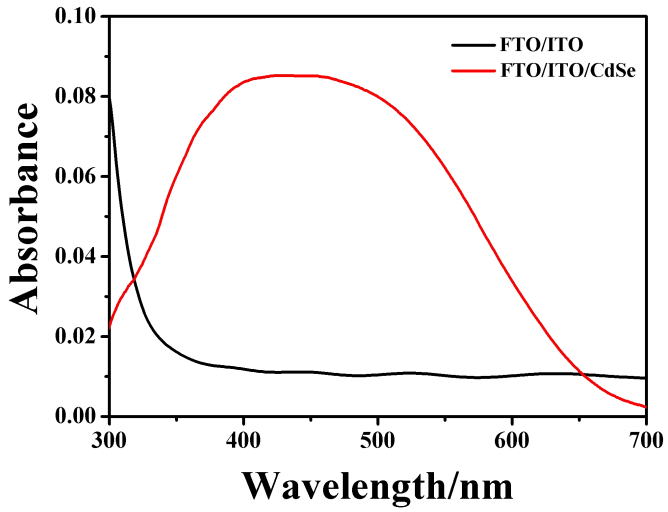

Figure S5. UV-vis absorption spectra of FTO/ITO and FTO/ITO/CdSe electrodes.

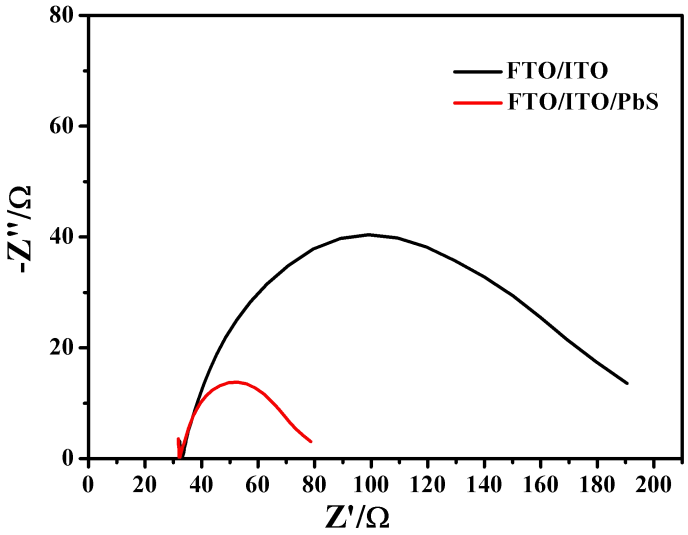

Figure S6. Nyquist plots of three electrodes under the same conditions. All of the spectra were collected at -0.8 V vs Ag/AgCl by scanning from 0.1 Hz to 10^5 Hz with an amplitude of 5 mV in 0.5 M Na_2SO_4 solution.

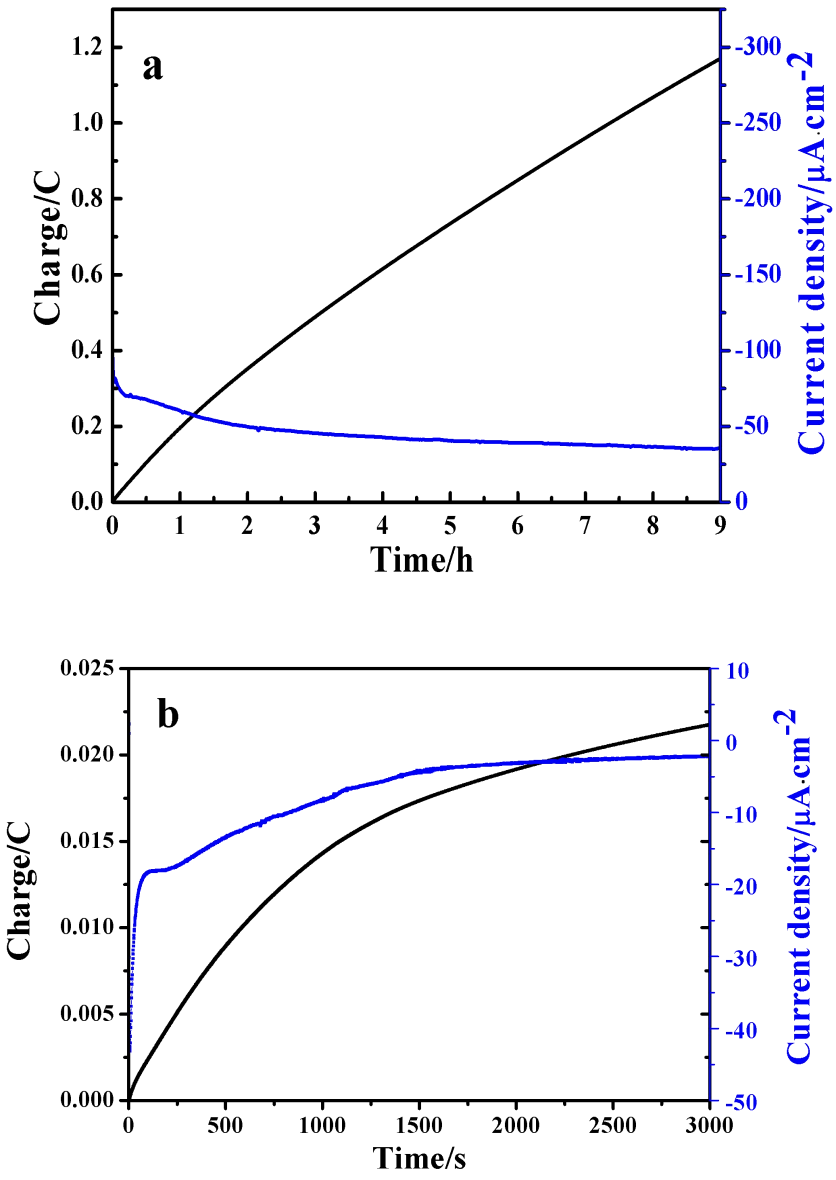

Figure S7. Charge-time and current-time curves of FTO/ITO/PbS (a) and FTO/ITO/CdSe (b) photocathodes under visible-light illumination at -0.222 V vs Ag/AgCl in air saturated electrolyte (0.5 M Na_2SO_4).

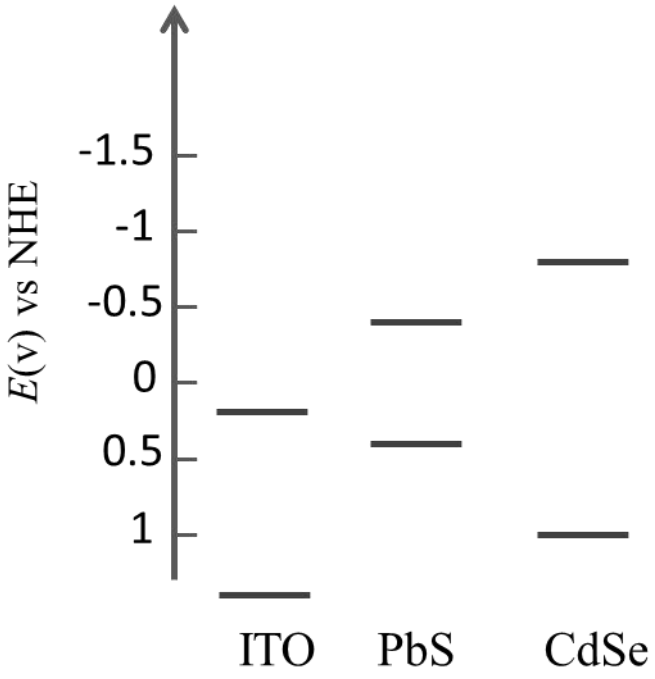

Figure S8. Energy diagrams of the ITO conduction band and metal sulfide.