Supporting Information

_In Situ_ Growth of CuS and Cu$_{1.8}$S Nanosheet Arrays as Efficient Counter Electrodes for Quantum Dot-Sensitized Solar Cells

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(a) EDS results of (a) CuS and (b) Cu$_{1.8}$S CEs.

**Fig. S1** EDS results of (a) CuS and (b) Cu$_{1.8}$S CEs.
**Fig. S2** SEM images of CuS products prepared at other different conditions: (a) the FTO substrate without seeding treatment, (b) the FTO substrate seeded via drop cast method. Insets are the magnified images of (a, b), respectively.

**Fig. S3** SEM images of CuS nanosheets grown on FTO substrates via solvothermal process in 40 mL ethanol containing (a) 0.6 g Cu(NO₃)₂, 0.8 g thiourea, at 150 °C for 24 h; (b) 0.3 g Cu(NO₃)₂, 0.4 g thiourea, at 180 °C for 24 h. The FTO substrates were seeded CuS via spin coating method; insets are the corresponding magnified images of (a, b), respectively.
Fig. S4 SEM images of Cu$_{1.8}$S nanosheets grown on FTO substrates via solvothermal process in 40 mL ethanol containing (a) 0.25 g CuCl, 0.4 g thiourea, at 180 °C for 24 h; (b) 0.25 g CuCl, 0.4 g thiourea, at 150 °C for 12 h. The FTO substrates were all seeded CuS via spin coating method; insets are the corresponding magnified images of (a, b), respectively.

Fig. S5 J-V curves of the QDSSCs based on different CEs with several tests in a period time of about 3 hours: (a) Cu$_2$S on brass, (b) Pt, (c) CuS, and (d) Cu$_{1.8}$S.