Supporting Information

Phase Conversion from Hexagonal CuS_ySe_{1-y} to Cubic $Cu_{2-x}S_ySe_{1-y}$: Composition Variation, Morphology Evolution, Optical Tuning, and Solar Cell Applications

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Table S1 Composition ratios of the Cu-S-Se samples (0.75 mmol of S and 1.25 mmol of Se in the reactants) obtained with different annealing durations.

Duration	0 h	2 h	6 h	7.5 h	8.5 h	10 h
Cu:S:Se ratio	50:27:23	51:27:22	53:26:21	57:26:17	59:25:16	62:24:14

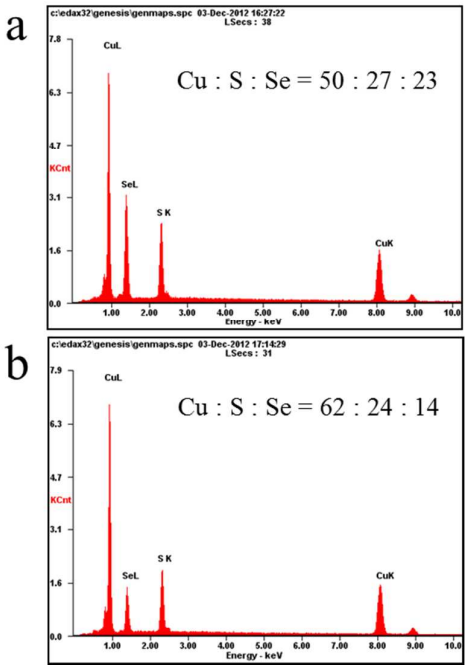

Figure S1 EDS spectra of (a) hexagonal CuS_ySe_{1-y} nanoplates prepared without annealing, indicating y=0.54, and (b) FCC $Cu_{2-x}S_ySe_{1-y}$ stacked nanoplate assemblies obtained after 10 h annealing at 100 °C, showing x=0.37, y=0.63. The samples were deposited on Si wafers for EDS measurement.

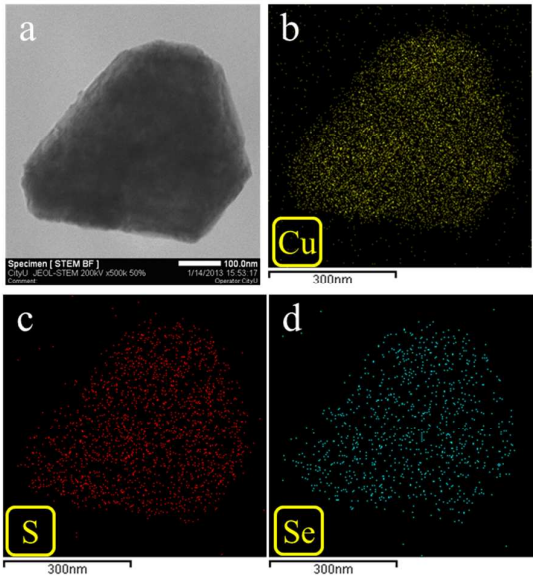

Figure S2 STEM image of the FCC $Cu_{2-x}S_ySe_{1-y}$ (x=0.37, y=0.63) stacked nanoplate assemblies and the corresponding EDS mappings of Cu, S and Se elements.

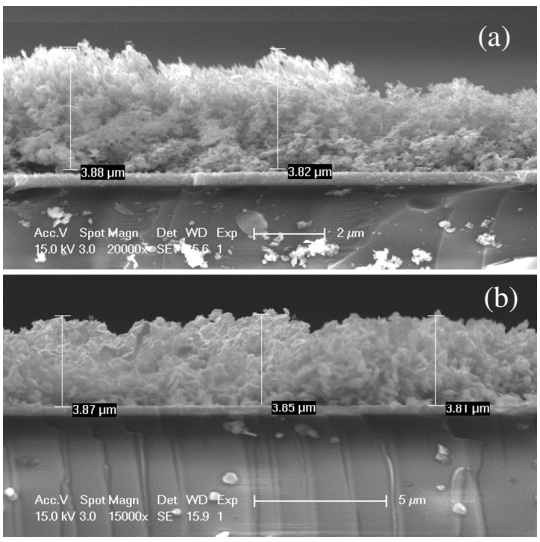

Figure S3 Cross-section SEM images of (a) the CuS_ySe_{1-y}/FTO (y=0.54) CE and (b) the $Cu_{2-x}S_ySe_{1-y}$/FTO (x=0.37, y=0.63) CE.

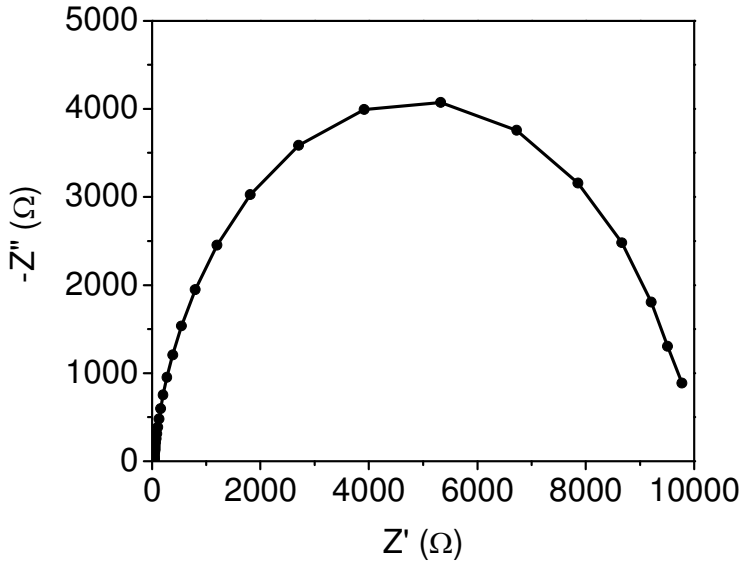

Figure S4 Nyquist plot of the Pt/FTO symmetric dummy cell containing polysulfide redox electrolyte.

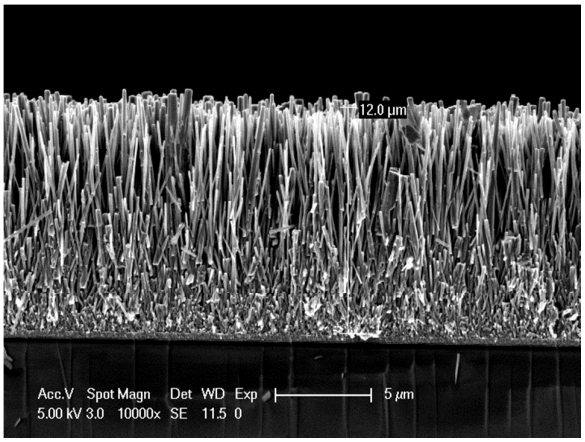

Figure S5 Cross sectional SEM image of the ZnO/ZnSe/CdSe/ZnSe nanocable array, showing a length of 12 μm.