Electronic supplementary information

A Robust and Low-Cost Strategy to Prepare Cu$_2$ZnSnS$_4$
Precursor Solution and Its Application in Cu$_2$ZnSn(S,Se)$_4$ Solar Cells

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Figure S1. A digital photograph of graphite box.
Figure S2. A digital photograph of CZTSSe solar cells.

Figure S3. XPS spectra of the as-fabricated CZTS thin film.
**Figure S4.** XPS spectra of the selenized CZTSSe thin film.
Figure S5. The band gap of selenized CZTSSe thin film was calculated by extrapolating the Kubelka-Munk function to K/S=0.