

Supporting Information

Aqueous Solution-Phase Selenized CuIn(S,Se)₂ Thin Film Solar Cells Annealed under Inert Atmosphere

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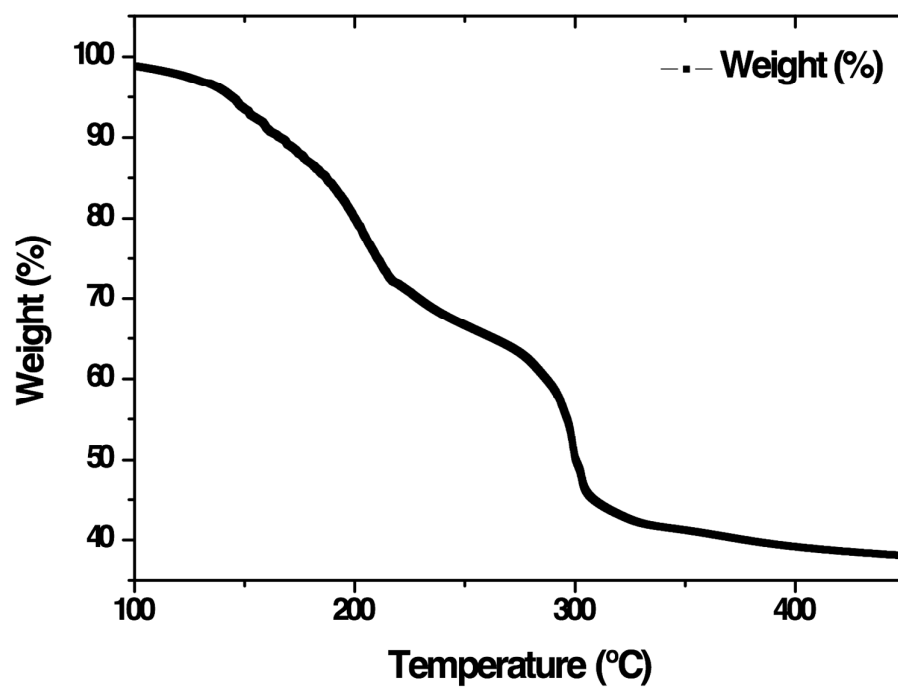


Figure S1. TG analysis of aqueous-based Cu-In-S ink. This analysis was performed in an air atmosphere at 150 cc min^{-1} with a heating rate of $10 \text{ }^{\circ}\text{C min}^{-1}$.

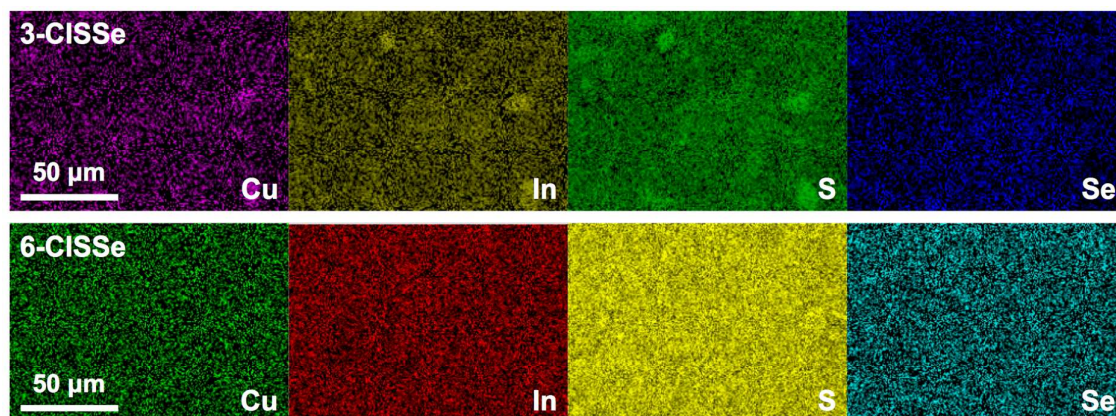


Figure S2. Compositional mapping images of CISSe film surfaces.

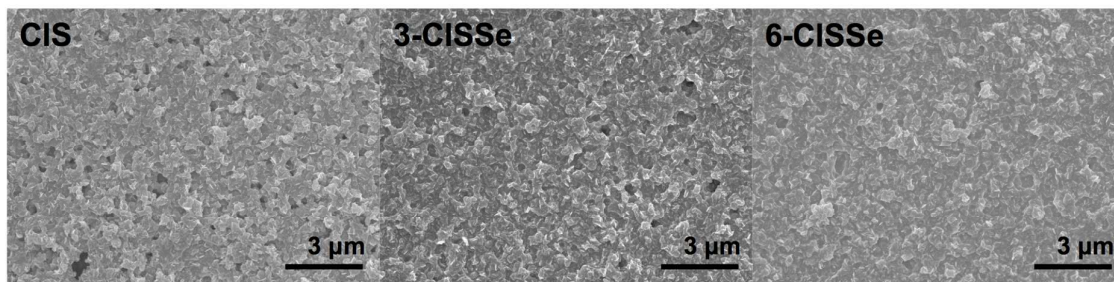


Figure S3. Surface microstructure of the as-prepared CIS/CISSe absorber layer.

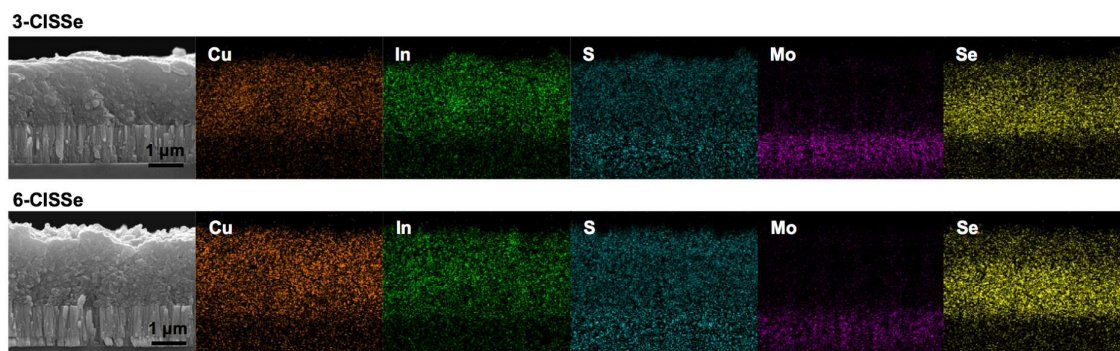


Figure S4. Cross-sectional EDX mapping of ASP-CISSe layers deposited on Mo/SLG substrate.

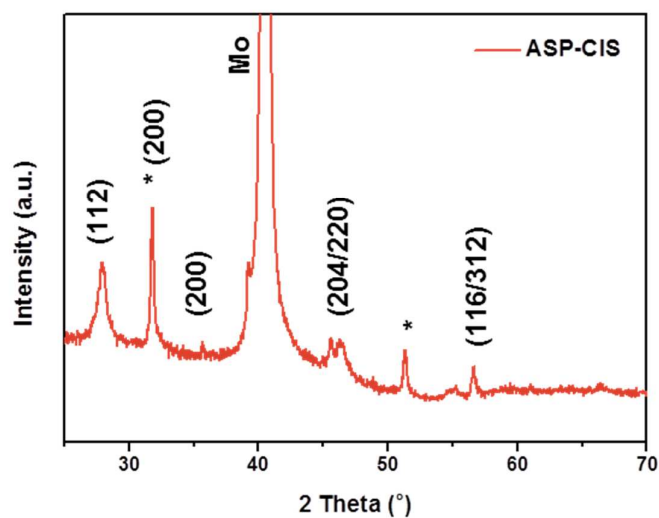


Figure S5. XRD results for ASP-CIS film deposited on Mo-coated substrate. All samples were dried in ambient air at 300 °C. Asterisks in the figure indicate binary metal sulfide secondary phase.

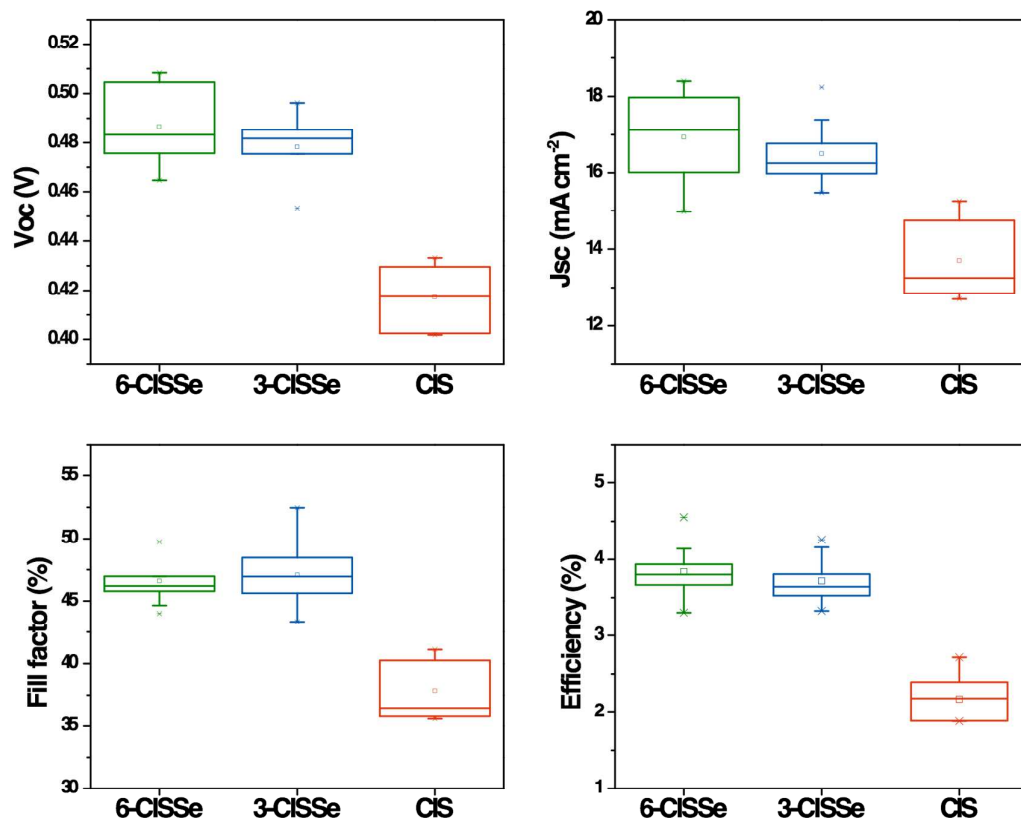


Figure S6. V_{oc} , J_{sc} , FF, and efficiency of CIS/CISse solar cells.

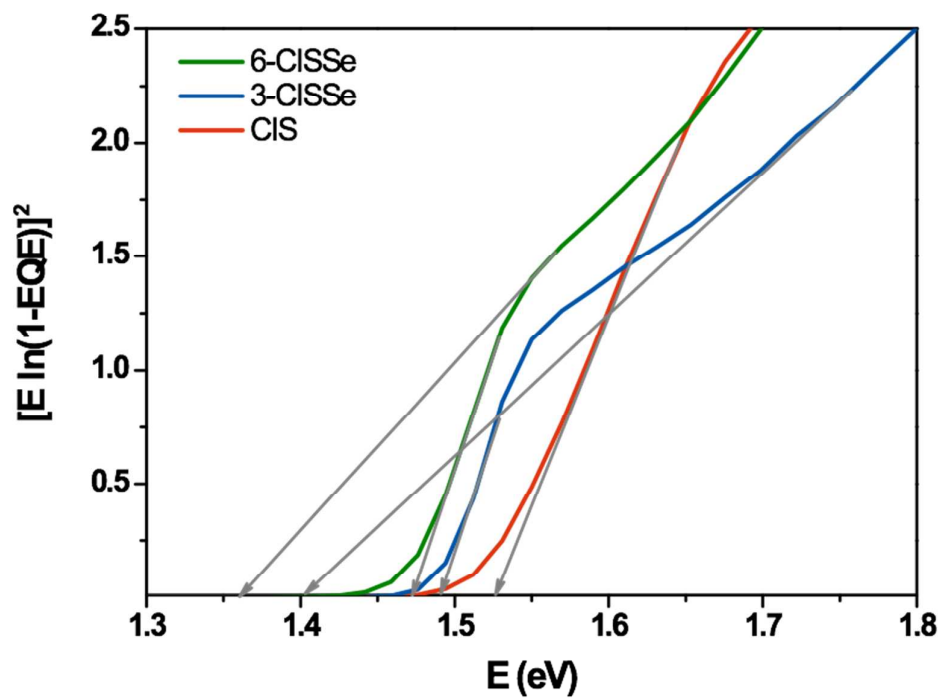


Figure S7. The band gap of CIS was determined to be 1.53 eV by fitting a plot of $[E \ln(1-EQE)]^2$ vs. E near the band edge. 3-CISSe and 6-CISSe had band gaps in the range of 1.40 – 1.49 eV and 1.36 – 1.46 eV, respectively.