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Supporting Information

Thiol-Amine-Based Solution Processing of Cu₂S Thin Films for Photoelectrochemical Water Splitting

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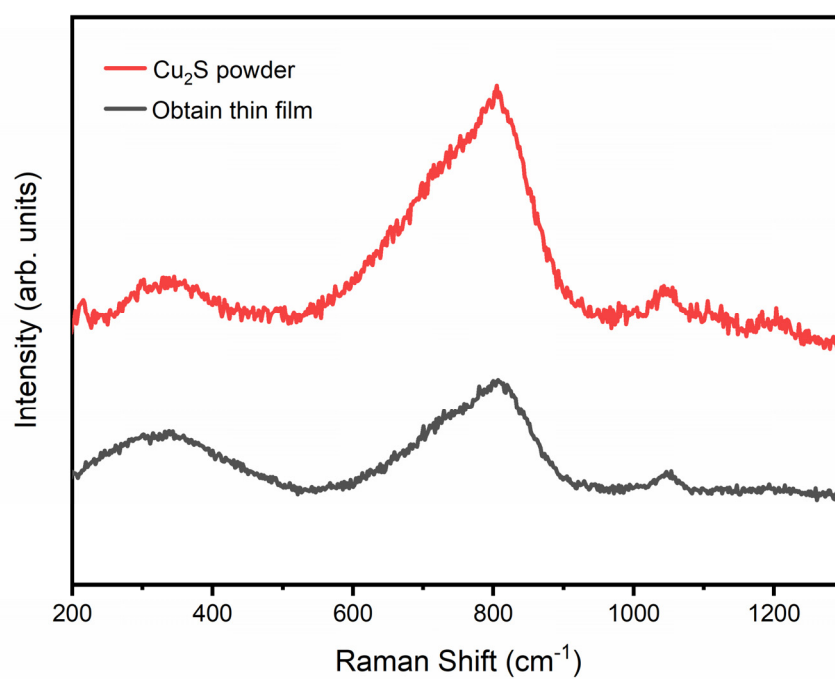


Figure S1. Raman spectra of Cu₂S powder and the obtained thin film.

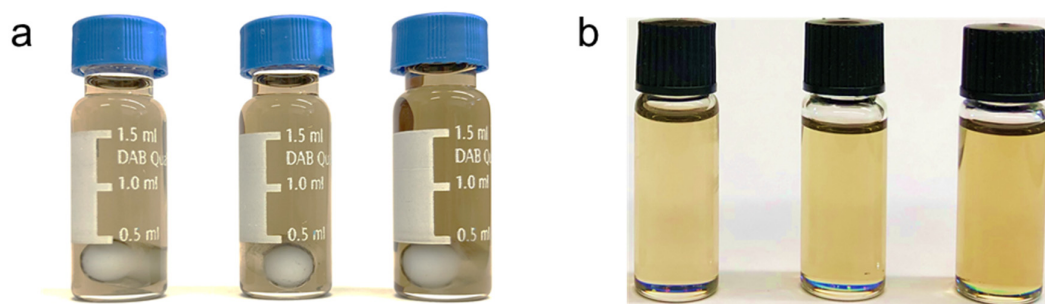


Figure S2. Optical images of 0.6, 0.8 and 1.0 M Cu-S molecular inks (a) before and (b) after filtering with 0.2 μm PTFE filters.

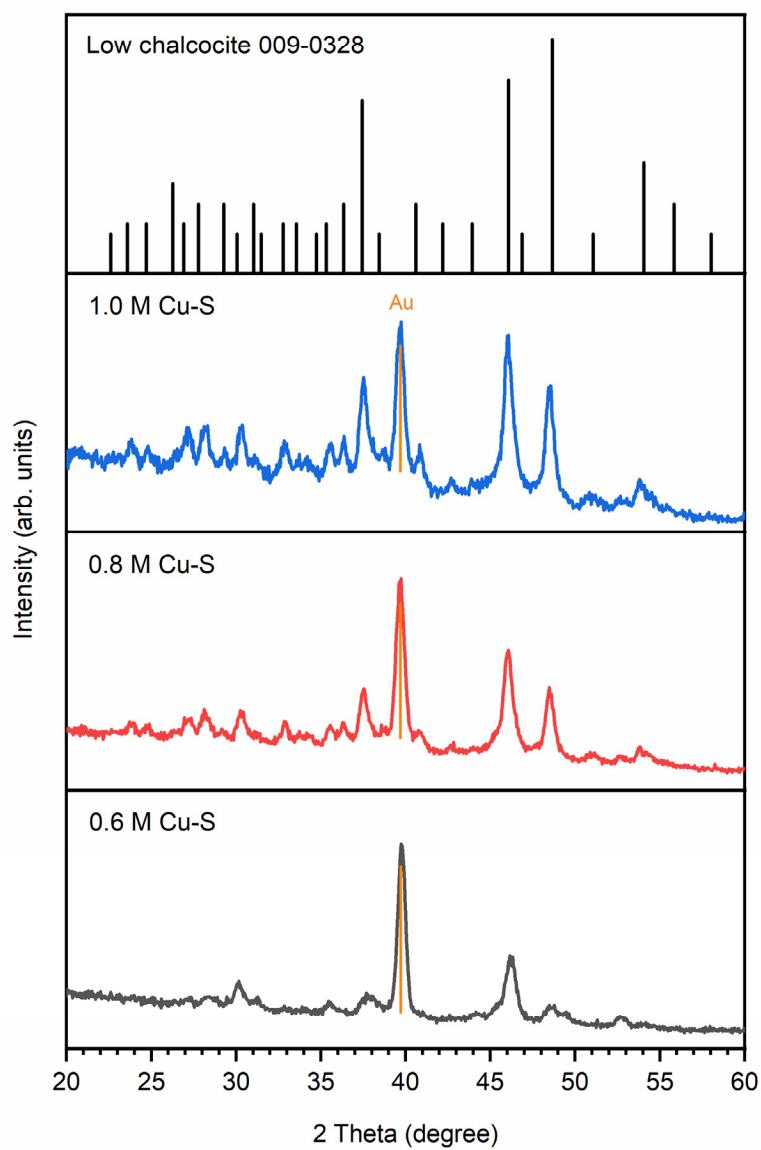


Figure S3. Grazing incidence XRD patterns of 3 coats- Cu_2S thin films prepared from 0.6 M, 0.8 M and 1.0 M Cu-S molecular inks and low chalcocite JCPDS 009-0328.

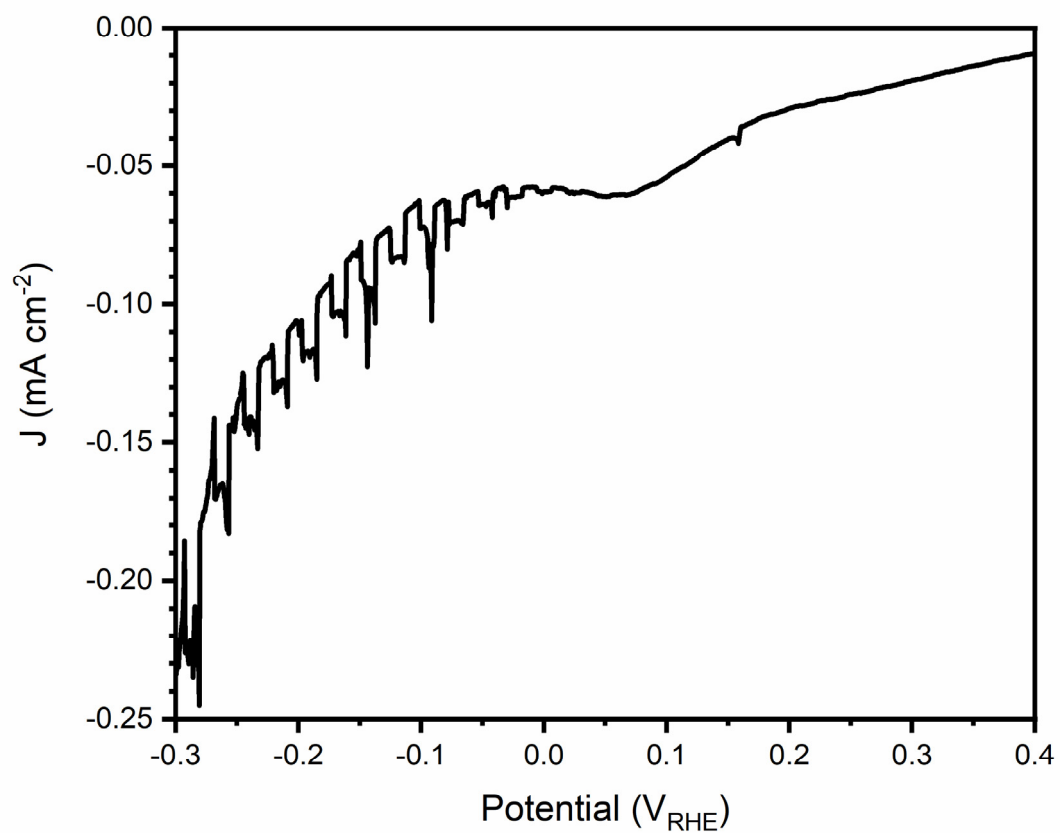


Figure S4. *J-E* curve of the bare Cu₂S thin film prepared from 0.8 M Cu-S molecular ink under simulated chopped AM 1.5 G illumination (100 mW cm⁻²).

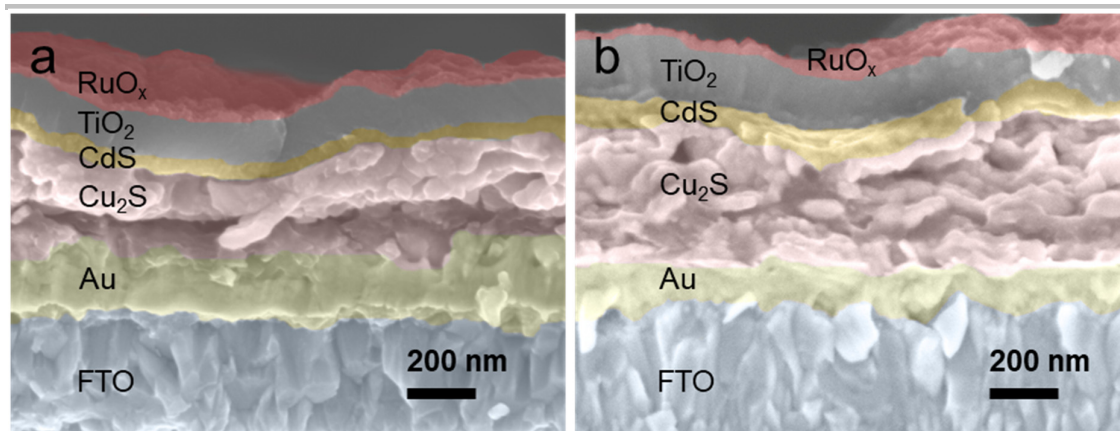


Figure S5. Cross-sectional false-colored SEM images of Cu₂S photocathodes based on Cu₂S thin films prepared from (a) 0.6 M and (b) 1.0 M Cu-S molecular inks.

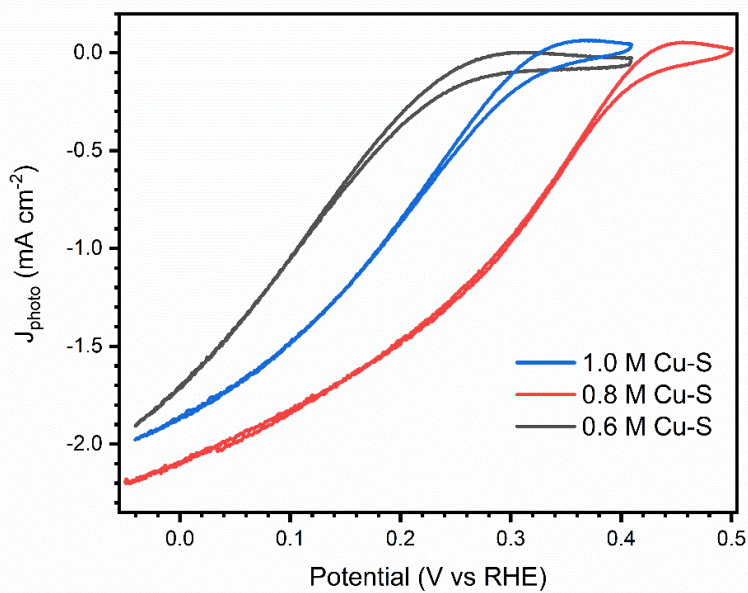


Figure S6. Cyclic voltammetry (CV) scans of Cu_2S photocathodes based on Cu_2S thin films prepared from 0.6 M, 0.8 M and 1.0 M Cu-S molecular inks.

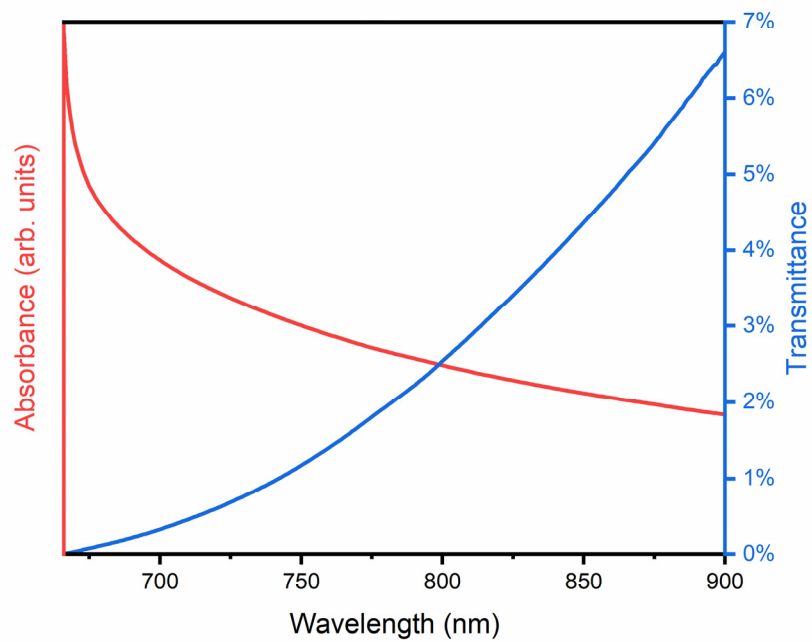


Figure S7. UV-Vis absorbance and transmittance spectra of the Cu_2S thin film prepared from 0.8 M Cu-S molecular ink measured in transmission mode.