

Construction of ZnO/ZnS/CdS/CuInS₂ Core-shell Nanowire Arrays via Ion Exchange: p-n Junction Photoanode with Enhanced Photoelectrochemical Activity under Visible Light

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STEM-EDS elemental mapping

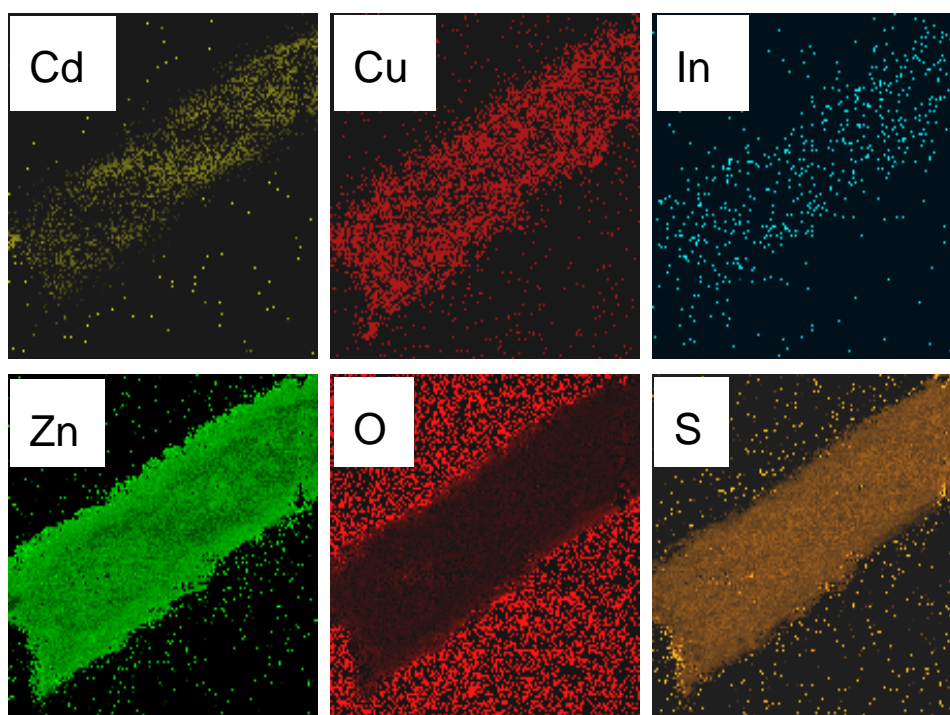


Fig. S1 STEM-EDS elemental maps of a ZnO/ZnS/CdS/CuInS₂ nanowire, Cd, Cu, In, Zn, O and S, respectively.

Fig. S1 displays STEM-EDS elemental mapping of a single nanowire. Cd, Cu, In, Zn, O and S elements distributed evenly over the entire nanowire without technically noticeable separation.

XPS analysis

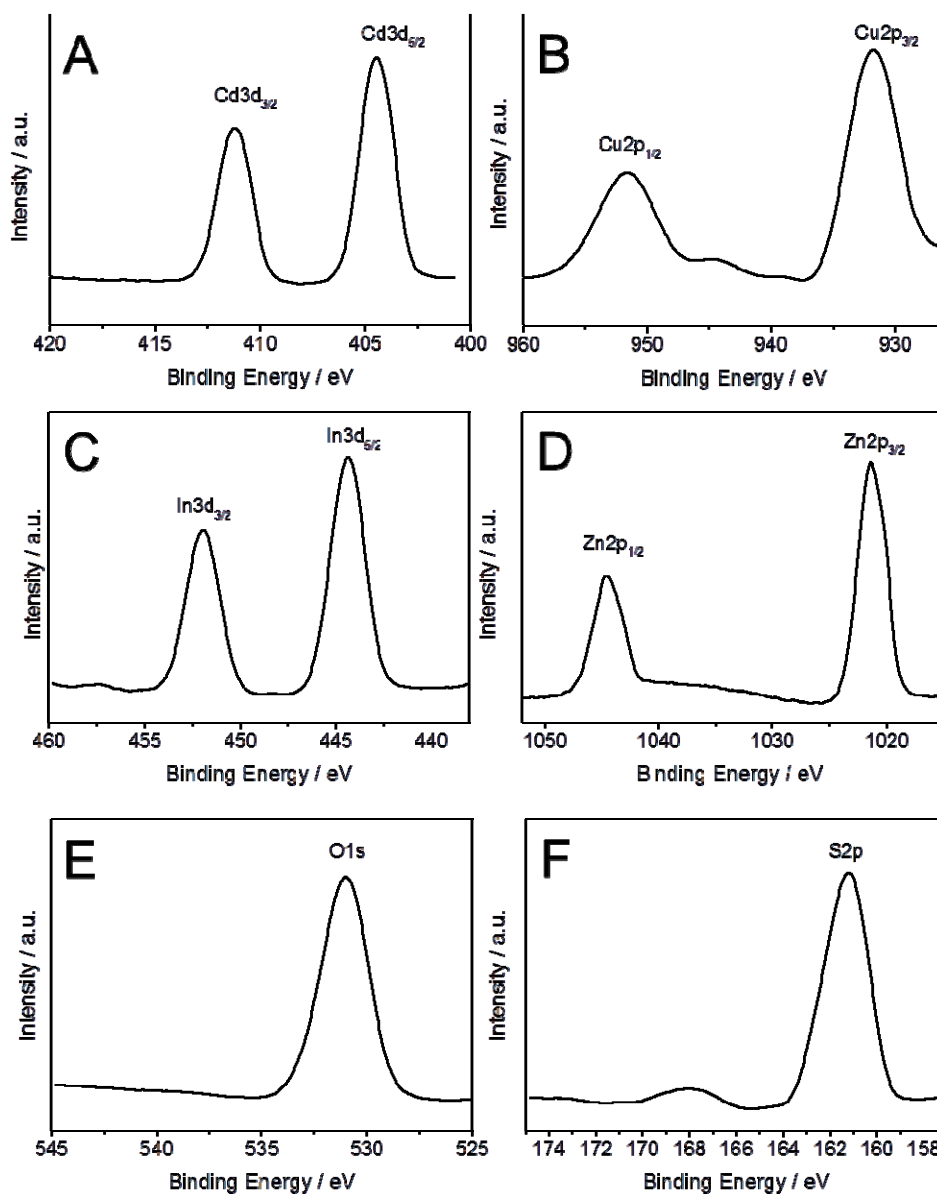


Fig. S2 XPS spectra of (A) Cd 3d, (B) Cu 3d, (C) In 3d, (D) Zn 2p, (E) O 1s and (F) S 2p of the ZnO/ZnS/CdS/CuInS₂ sample.

XPS spectra of the ZnO/ZnS/CdS/CuInS₂ are given in Fig. S2. Cd, Cu, In, Zn, O, and S elements are detected. The peaks are calibrated with respect to adventitious carbon at 284.8 eV. The binding energy of Cd 3d_{5/2}, Cu 2p_{3/2}, In 3d_{5/2}, Zn 2p_{3/2}, O 1s

and S 2p are 404.6, 931.8, 444.4, 1021.4, 531.0 and 161.2 eV, respectively, which agree with ZnO, ZnS, CdS and CuInS₂¹⁻².

References and Notes

1. Li, Y. B.; Liu, Z. F.; Wang, Y.; Liu, Z. C.; Han, J. H.; Ya, J., ZnO/CuInS₂ Core/Shell Heterojunction Nanoarray for Photoelectrochemical Water Splitting. *Int. J. Hydrogen Energy* **2012**, *37*, 15029-15037.
2. Andres, S.; Lehmann, C.; Pettenkofer, C., Epitaxial Growth of ZnO on CuInS₂ (112). *Thin Solid Films* **2009**, *518*, 1032-1035.