

ELECTRONIC SUPPLEMENTARY INFORMATION

Low residual donor concentration and enhanced charge transport in low-cost electrodeposited ZnO

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1. Field-emission scanning electron microscope (FESEM) images of a cleaved Cu/ZnO sample:

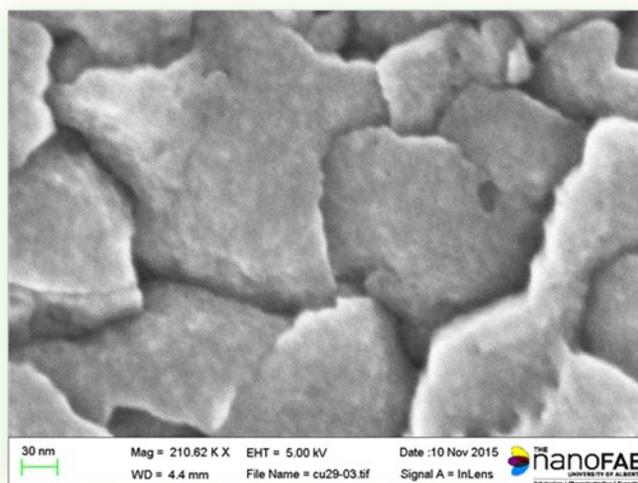


Fig. S1: High magnification top-view FESEM image of a cleaved ZnO/Cu sample showing film morphology.

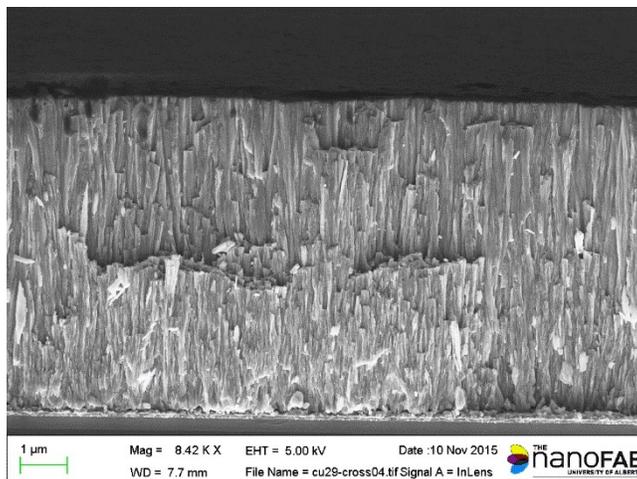


Fig. S2: Cross-sectional FESEM image of a cleaved ZnO/Cu sample showing columnar grain shapes.

2. Optical absorption and photoluminescence spectra of Cu/ZnO films

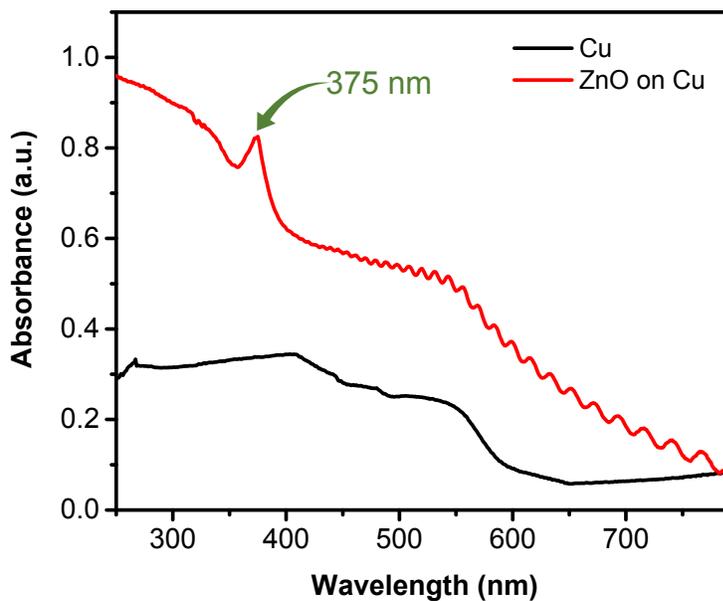


Fig. S3: Optical spectra were measured by the spectrophotometry technique for two samples: n-Si/SiO₂/TiW/Cu (black line) and n-Si/SiO₂/TiW/Cu/ZnO (red line). The thickness of the electrodeposited ZnO film is ~ 6.9 μm as measured by cross-sectional FESEM.

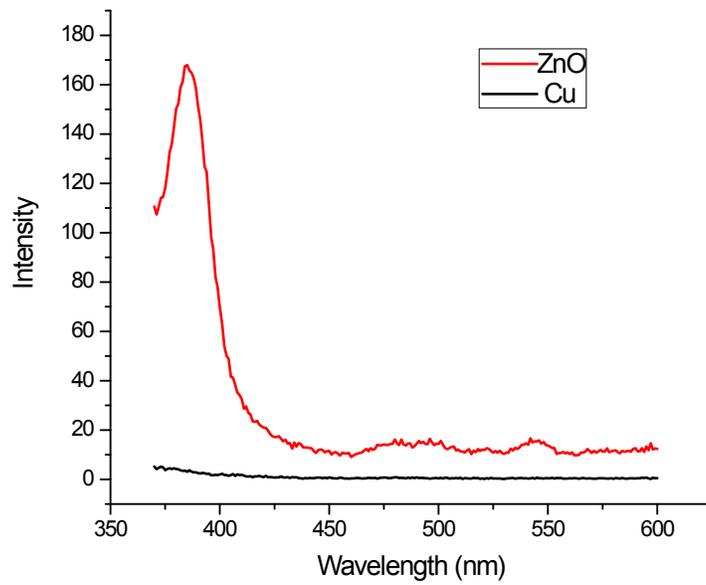


Fig. S4: Room temperature photoluminescence spectra from two samples: n-Si/SiO₂/TiW/Cu (black line) and n-Si/SiO₂/TiW/Cu/ZnO (red line), were measured for an excitation wavelength of 345 nm.