

Abstract Submitted
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Copper Iodide (CuI) Nanoparticles as a Hole Transport Layer to Cadmium Telluride (CdTe) Solar Cells.¹ DIPENDRA POKHREL, EBIN BASTOLA, KAMALA KHANAL SUBEDI, SUMAN RIJAL, MANOJ K JAMARKATTEL, RASHA ABBAS AWNI, ADAM B PHILLIPS, YANFA YAN, MICHAEL J HEBEN, RANDY J ELLINGSON, University of Toledo — We report on the use of copper iodide (CuI) nanoparticles as a hole transport layer (HTL) on cadmium telluride (CdTe) solar cells. We synthesized the CuI NPs using solution precursors at room temperature. Scanning electron microscopy (SEM) and X-ray diffraction (XRD) were performed to understand the morphological and structural properties of CuI NPs. The XRD pattern suggests pure γ -CuI phase in zinc-blend structure. The UV-vis absorption spectra of CuI NPs in dimethylformamide (DMF) solvent reveals a wide optical band gap energy of ~ 3.0 eV. Utilizing these CuI NPs as an interface layer, a photoconversion efficiency of 14.8 % was measured with fill factor of 79.2 % along with Au back electrode. The CuI NPs on CdS/CdTe device with indium tin oxide (ITO) as a back electrode enhances device performance as compared to cells without CuI NPs. The stability of the devices under thermal stress will be reported.

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