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Performance Evaluation of $CuGaO_x$ Back Buffer Layer in Bifacial CdTe Solar Cells[1] AESHA P. PATEL, KAMALA KHANAL SUBEDI, DIPENDRA POKHREL, EBIN BASTOLA, ADAM B. PHILLIPS, MICHAEL J. HEBEN, RANDY J. ELLINGSON, Wright Center for Photovoltaic Innovation and Commercialization, Department of Physics and Astronomy, The University of Toledo — Since thin-film CdTe device efficiency has reached 22.1%, the next step is to use novel bifacial device configuration to increase energy yield per unit area. Polycrystalline CdTe is affected by interface defects at contacts, and back-contact challenges reduce device performance for back side illumination. Introducing a suitable back buffer layer can yield a positive initial Fermi level offset with the absorber layer. However, deep work function of CdTe (5.7 eV) limits development of a back buffer which can reduce interface defects and improve minority carrier lifetime and device performance for glass and film side illumination. Here, we used spin-coating to synthesize $Cu_{0.3}Ga_{0.7}O_x$, a p-type transparent conductor serving as back-buffer layer for a CdTe cell. For bifacial architecture, these cells were completed with Sn-doped In_2O_3 (ITO) standard back contact. Time-resolved photoluminescence(TRPL), and current-voltage(J-V) measurements were recorded, and results of thermal stability testing will be reported. Our results showed improved carrier lifetime and device efficiency for cells with $Cu_{0.3}Ga_{0.7}O_x$ back buffer for glass and film side illumination.

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