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J-V Distortion in MZO/CdTe Solar Cells RAMESH PANDEY, ANDREW MOORE, JAMES SITES, Colorado State University — In recent times, sputtered $Mg_xZn_{1x}O$ (MZO) has emerged as a better alternative emitter layer for CdTe thin film solar cells(TFSC).The wider band gap and higher transmission of blue photons in MZO helps to mitigate absorption losses typical of traditional CdS buffer layer. Distortion in JV curve has been observed in CdTe devices with MZO as emitter at various illumination conditions. Previously such distortions have been reported in Zn(S,O)/$CuInGaSe_2$, CdS/$CuInSe_2$ and CdS/$CuIn(SSe)_2$ devices. These distortions are primarily attributed to the presence of secondary barrier formed at the interface between the absorber and emitter layer. The photo-conductivity of the emitter layer at various illumination conditions modifies the barrier due to change in the trap occupancy in the emitter/absorber interface giving rise to such J-V characersitics. in this work, we have tried to quantify the reason for such distortion in MZO/CdTe devices along with the impact of Cu doping and migration of Cu related impurities in CdTe by putting devices under various stress conditions. The results suggest that the J-V distortion is related to the movement of Cu related trap states in the region of cdTe/MZO interface.

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