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Barrier Height at CdTe/polymer Heterojunction[1] TYLER LUCAS, BRANDON BARNES, FERNANDA DUARTE, BROOKE MYERS, WEINING WANG, Seton Hall University — Forming a stable back contact on a solar cell with Cadmium Telluride (CdTe) substrate that has low resistance and diffusion characteristics has challenged the expected efficiency of the solar cell. Traditional CdTe solar cell contacts are usually constructed with copper-based back contact which causes problems with the Cu diffusing into the CdTe/CdS junction, causing degradation of the devices. We have shown in our previous work [1] that the traditional back contact can be replaced by conducting polymer with satisfactory efficiency. We found that the characteristics of CdTe solar cells with polymer back contact depend on the conductivity and the work function of the polymer. In this work, we report our recent studies on the barrier height at CdTe/polymer junctions with different polymers' work function. A series of CdTe solar cells were fabricated with poly(3,4-ethylenedioxythiophene) polystyrene sulfonate (PEDOT:PSS) as the back contact. The work function of those polymer was measured using the Kelvin Probe technique. The barrier heights at those heterojunctions were determined experimentally using the "turning point" technique. [2] Based on our studies, we will discuss how to improve the CdTe/polymer heterojunction and provide criteria on a good polymer back contact for CdTe solar cells. [1] Weining Wang, Naba Raj Paudel, Yanfa Yan, Fernanda Duarte, Michael Mount, *Journal of Materials Science: Materials in Electronics,* **27**(2), 1057-1061 (2016) [2] G. T. Koishiyev, J. R. Sites, S. S. Kulkarni, and N. G. Dhere, *Proc. IEEE Photovoltaic Specialists Conf.* **33**, 71 (2008).

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