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Temperature dependence of conductivity measurement for PEDOT:PSS and corresponding solar cell performance[1] FERNANDA DUARTE, BROOKE MYERS, TYLER LUCAS, BRANDON BARNES, WEINING WANG, Seton Hall University — Conducting polymers have been studied and used widely; applications include light-emitting diodes, solar cells, and sensors. In our previous work, we have shown that conducting polymers can be used as the back contact of CdTe solar cells. Our results show that the efficiency of the CdTe solar cell increases as the conductivity of the polymer increases. For this reason, it is of interest to study the polymer conductivity's temperature dependence, and how it affects the solar cell. In this work, we show our studies on temperature dependence of conductivity measurement for poly(3,4-ethylenedioxythiophene) polystyrene sulfonate (PEDOT:PSS), and its effect on the CdTe/PEDOT:PSS solar cells. A series of PEDOT:PSS with different conductivities were studied, and a temperature-varying apparatus built in house, using a thermoelectric cooler module, was used to vary the temperature of the polymer films. The activation energy of PEDOT:PSS with different conductivity will be reported. The effect of the temperature on the short-circuit current, open-circuit voltage and efficiency of the solar cells will also be discussed.

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