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Optical and Electrical Characterization of CdTe Functionalized ZnO Nanowires for Energy ANTHONY MAYO, Fisk University, HAIYANG XU, YICHUN LIU, Northeast Normal University, RICHARD MU, Fisk University — Significant progress has been made recently in understanding optoelectronic properties of ultrasmall quantum dots (a few nanometer in size). Nanostructured photovoltaic devices seems to have clear advantages over the bulk counterparts to address energy problems facing humanity. Nanostructured devices require much less mass and not exclusively limited by materials of choice, and favoring integration for multifunctionality. It is known that we can effectively harvest solar energy by tuning the optical gap and enhancing photon absorption across section through various nanomaterials syntheses. The remaining challenges is to be able to purposely control and manipulate the energy transfer pathways for particular needs. Thus, charge and exciton transports must be carefully evaluated. The knowledge of charge and exciton mobility, coherent and incoherent hopping due to electronic coupling, energy redistribution and partition in real time may be the critical steps. Here, CdTe functionalized ZnO nanowires have been fabricated with Glazing Angle Deposition technique as a model system. A series materials characterization techniques (confocal Raman, optical, photoluminancence and electrical) have been conducted and optimized to provide valuable information about the nanostructure. Results will be present and discussed at the meeting along with the implications. These findings serve as the solid foundation for more sophisticated study that follows.

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