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Transition Metal Doped ZnS Quantum Dots for Photovoltaic Applications[1] TRIEU N. LE, SUNY Oswego, THILINI K. EKANAYAKA , University of Nebraska-Lincoln, ANNIKA NEUFELD-KREIDER , SUNY Oswego, ARCHIT DHINGRA , TAKASHI KOMESU , University of Nebraska-Lincoln, ANDREW J. YOST , Oklahoma State University, CAROLINA C. ILIE , SUNY Oswego — Traditional semiconductors can be doped with magnetic transition metal elements to create the diluted magnetic semiconductors; their properties change depending on the dopants. In some cases, this is corresponding to an enhancement in the photo-to-current efficiency of doped quantum dots in the sensitized solar cells. Here, we observed the optical and transport properties of the transition metals doped with Zinc Sulfide quantum dots and optimized them for better photovoltaics. Additionally, we explored how the different dopants lead to changes in the bandgap and distinguished the characteristic of the eight diluted magnetic semiconductors. By further analyzing the absorption data, Cobalt-Nickel doped ZnS was found to have the highest absorbance in the visible range out of all the single and co-doped, as well as tri-doped quantum dots which made it the best candidate for optoelectronic device fabrication.

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