Abstract Submitted
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Synthesis and Characterization of Co-doped ZnO Dilute Magnetic Semiconducting Nanorods[1] N. DAS, S. KHANRA, S. BHAMIDIPATI, K. MANIVANNAN, P. KAHOL, K. GHOSH, Missouri State University, DEPARTMENT OF PHYSICS ASTRONOMY AND MATERIALS SCIENCE TEAM — Transition-metal doped ZnO dilute magnetic semiconducting nanomaterials are considered as ideal systems for carrying out research in the field of spintronics as they can successfully combine magnetism and electronics in a single substance. ZnO is a wurtzite-type wide-bandgap semiconductor of the II-VI semiconductor group with band gap energy of 3.37 eV. Hydrothermal synthesis of undoped ZnO and Co-doped ZnO nanorods is carried out using aqueous solutions of $Zn(NO_3)_2.6H_2O$, $Co(C_2H_3OO)_2.4\ H_2O$, and using NH_4OH as hydrolytic catalyst. Nanomaterials of different sizes and shapes were synthesized by varying the process parameters such as molarity (0.15M, 0.3M, 0.5M) and pH (8-11) of the precursors, growth temperature (130°C), and annealing time during the hydrothermal Process. Structural, morphological, optical and magnetic properties are studied using various techniques such as XRD, SEM, UV-vis spectroscopy, and SQUID magnetometer. XRD and SEM studies reveal nanorods with hexagonal wurtzite structure with length in the range of 200 to 500 nm, and cross section in the range of 30 to 60 nm. Detailed structural, optical, and magnetic properties will be discussed in this presentation.

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