

Abstract Submitted  
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**Impedance measurement of Cobalt doped ZnO Quantum dots.**

RAM TIWARI, AMRIT KAPHLE, PARAMESWAR HARI, Univ of Tulsa — We investigated structural, thermal and electrical properties of ZnO Quantum dots grown by precipitation method. QDs were spin coated on ITO and annealed at various temperatures ranging from 100<sup>0</sup>C to 300<sup>0</sup>C. ZnO QDs were doped with cobalt for concentration ranging from 0-15%. XRD measurement showed increase in bond length, strain, dislocation density and Cell volume as the doping level varied from 0% to 15%. Impedance Spectroscopy measurements represented by Cole-Cole plot showed reduction in resistance as the cobalt doping concentration increased from 0-15%. Thermal activation energy was obtained by plotting resistivity Vs temperature for doped samples at temperatures from 100<sup>0</sup>C to 300<sup>0</sup>C. The thermal activation energy decreased from 85.13meV to 58.21meV as doping increased from 0-15%. Relaxation time was extracted by fitting data to RC model. Relaxation time varied from 61.57 ns to 3.76 ns as the cobalt concentration increased from 0% to 15%. We will also discuss applications of cobalt doped ZnO QDs on improving conversion efficiency of solar cells.

Ram Tiwari  
Univ of Tulsa

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