Optical and Magnetic properties of Transition metal doped ZnO and TiO_2

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A comprehensive research program to tailor the structural, magnetic and optical properties of wide band gap oxide semiconductors through transition metal doping is being pursued. Preliminary results from the transition metal doped Zinc oxide and Titanium dioxide semiconductors suggest that such doping can modify the lattice structure, particle/grain size and morphology, band gap, and the magnetic behavior. Room temperature ferromagnetism has been developed in several samples prepared in the thin film and powder forms. The powder and thin film samples were characterized by XRD, DRUVS, PIXE, RBS, TEM, XPS, EPR and VSM to monitor the structural, optical and magnetic properties associated with them. More investigations to understand how the dopants are incorporated in to the host lattices and the origin of the observed ferromagnetism and band gap modifications are currently underway.

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