

Correction effect in cobalt doped ZnO ?

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The earlier studies suggested the magnetic ground state of ZnO:Co is reported to be associated with extrinsic structural factors. Some found ZnO:Co to be ferromagnetic (FM); while the oxygen vacancy stabilized the anti-ferromagnetism (AFM). Others states that the FM mediated by carriers in a spin polarized impurity band derived from extended donor orbitals. Until recently, the intrinsically AFM ground state was reported, the electronic structure of ZnO:Co is consistent with carrier mediated ferromagnetism. The experimental results on high quality single crystalline further revealed the different physical origins account for the FM stabilization due to reducing growth conditions and extrinsic n-type doping. The Conventional wisdom based on the bound magnetic polaron account for the diluted magnetic insulate (DMI) region are closely investigated. Potential applications based on the proposed physical origins of ZnO:Co in the DMI region is also presented.