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Synthesis, characterization and magnetic properties studies on $NdCr_{1-x}FexO_3$ perovskite ceramic compounds

Jada Shanker
Osmania University, Hyderabad, India

The polycrystalline perovskite ceramic compounds $NdCr_{1-x}FexO_3$ (x=0, 0.3, 0.5, 0.7, 1) were prepared by Sol-gel auto-combustion method and characterized by XRD and SEM. The preliminary structural analyses of the compound were analysed by X-ray diffraction technique, and it confirms single phase orthorhombic structure. A systematic investigation of temperature and field dependent magnetic measurements was performed on 9000C sintered pellets in the temperature range 1K to 400K at 100Oe, field ranges from -50kOe to 50kOe at 100K, 200K and 300K temperatures. The zero-field-cooled (ZFC) and field-cooled (FC) magnetization curves merge at a temperature well above the Neel's one. This suggests the occurrence of short-range magnetic order, which is induced by frustration effects. The frustration in this case results from the structural disorder due to the random distribution of the magnetic ions in the octahedral sites of the lattice. The detailed investigation of magnetic measurements of $NdCr_{1-x}FexO_3$ (x=0, 0.3, 0.5, 0.7, 1) perovskite ceramic compounds were discussed.

jadashanker.phd@gmail.com