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**Effect of Dy on Structural and Low Temperature Magnetic Properties of Ca0.7Dy0.3MnO3**

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**Abstract**

Investigated the structural and low temperature magnetic properties of polycrystalline single phase Ca0.7Dy0.3MnO3 compound which was prepared by solid state reaction method. From the room temperature (RT) X-ray diffraction measurements it is confirmed that formation of single phase orthorhombic structure, with Pnma space group and average grain size 2 μm was verified by SEM analysis. Rietveld refinement was carried out on RT X-ray diffraction data and obtained the structural parameters, a = 5.2811(2)Å, b = 7.5409 (1)Å and c = 5.2748(6) Å are well matching with previous reports. Low temperature DC magnetic measurements were carried out at 500 Oe to understand the magnetic ordering in Ca0.7Dy0.3MnO3, which shows the transition of antiferromagnetic to paramagnetic phase. The susceptibility measurement reveals antiferromagnetic transition (TN) at around 55 K. At low temperature below 10 K weak ferromagnetic ordering is observed. Inverse susceptibility and derivative of field cooled curve shows a clear anomaly around 55 K. Curie Weiss fitting was done on inverse susceptibility measurement and obtained the paramagnetic curie constant θp ∼ -57 K, which clearly indicates the evidence of antiferromagnetic ordering in the Ca0.7Dy0.3MnO3 sample.

**Keywords:**

Structure, Magnetism, Antiferromagnetism, Multiferroic

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