

Mössbauer studies of the Cr doped ordered perovskite

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The Cr doped ordered perovskite powder of $\text{Sr}_2\text{Fe}_{0.93}\text{Cr}_{0.07}\text{MoO}_6$ has been prepared by a solid-state reaction method. The chemical composition and the crystalline structure of the sample were confirmed with the Rutherford backscattering spectrometer spectrum and X-ray diffraction pattern analysis. The crystalline structure was determined to be tetragonal with lattice parameters $a_0 = 5.572 \text{ \AA}$ and $c_0 = 7.900 \text{ \AA}$, respectively. The magnetic properties of the $\text{Sr}_2\text{Fe}_{0.93}\text{Cr}_{0.07}\text{MoO}_6$ have been studied by the vibrating sample magnetometer and the Mössbauer spectroscopy. The saturation magnetization and the coercive force were 26.5 emu/g and 101.2 Oe at room temperature. Mössbauer spectra measurements of the $\text{Sr}_2\text{Fe}_{0.93}\text{Cr}_{0.07}\text{MoO}_6$ have been taken at various temperatures ranging from 15 to 450 K. Analysis of Mössbauer spectra has considered with next nearest-neighbour interactions and the anisotropic hyperfine field fluctuation. The anisotropic field fluctuation of $+H$ ($P_+ = 0.85$) is greater than that of $-H$ ($P_- = 0.15$).