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Program
THE CHARGE STRUCTURE OF COMBINED SYSTEM \((\text{La}_{0.8}\text{Sr}_{0.2}\text{MnO}_3)_x(\text{La}_{0.9}\text{Sr}_{0.1}\text{FeO}_3)_y\) AS INVESTIGATED BY MÖSSBAUER SPECTROSCOPY

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The charge structure of combined system of \((\text{La}_{0.8}\text{Sr}_{0.2}\text{MnO}_3)_x(\text{La}_{0.9}\text{Sr}_{0.1}\text{FeO}_3)_y\) and \(\text{La}_{0.8}\text{Sr}_{0.2}\text{FeO}_3\) (LSMO) is investigated by mainly Mössbauer spectroscopy. The prototypical half metal with 100% spin polarized \(\text{La}_{0.8}\text{Sr}_{0.2}\text{MnO}_3\) have low Neel temperature \((T_N)\) of 320 K, which is measured by SQUID magnetometer. The antiferromagnetically ordered \(\text{La}_{0.8}\text{Sr}_{0.2}\text{FeO}_3\) (LSMO) have possible charge ordering state of \(\text{Fe}^{2+}\) \(\text{Fe}^{3+}\) \(\text{Fe}^{4+}\), which include low-spin state of \(\text{Fe}^{3+}\) at and above 230 K. The LSMO with \(T_N\) of 370 K is found to be disordered phase resulting in low spin tetravalent iron with no magnetic hyperfine field of 0 kOe. However, The metastable \(\text{Fe}^{2+}\) ion is found instead of low-spin \((T_S)\) state in combined \((\text{LSMO})_0(\text{LSFO})_2\) system. The temperature dependence of Mössbauer spectra for \(\text{La}_{0.8}\text{Sr}_{0.2}\text{FeO}_3\) and combined \((\text{LSMO})_0(\text{LSFO})_2\) system are fitted as three sets of Zeeman pattern corresponding to \(\text{Fe}^{2+}\) and \(\text{Fe}^{3+}\) below 230 K. At and above 230 K, The fitted Mössbauer spectra for combined system are same at all temperature ranges. In case of \(\text{La}_{0.8}\text{Sr}_{0.2}\text{FeO}_3\) consists of two sets of six Lorentzians \(\text{Fe}^{2+}\) and one line for low spin of \(\text{Fe}^{3+}\) above 230 K. It is notify induced large field in combined system.

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