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**BOOK
OF
ABSTRACTS**



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The study of Mössbauer spectroscopy for $(\text{Nd}_{1-x}\text{Sm}_x)_{1/3}\text{Sr}_{2/3}\text{FeO}_3$.

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The $(\text{Nd}_{1-x}\text{Sm}_x)_{1/3}\text{Sr}_{2/3}\text{FeO}_3$ were synthesized by floating zone method and their magnetic properties and charge ordering(CO) transition related with lattice distortion be systematically investigated. Mössbauer spectra of $(\text{Nd}_{1-x}\text{Sm}_x)_{1/3}\text{Sr}_{2/3}\text{FeO}_3$ were taken at various temperatures range from 4.2 K to room temperature. The $(\text{Nd}_{1-x}\text{Sm}_x)_{1/3}\text{Sr}_{2/3}\text{FeO}_3$ ($x=0.0, 0.2, 0.4, 0.6, \text{ and } 0.8$) with lattice distortion present charge ordering(CO) and canted antiferromagnetic spin ordering below $T_{\text{co}} = T_{\text{N}}$. This phase transition is accompanying by charge disproportionation(CD) into nominally Fe^{3+} and Fe^{5+} sites. In this charge ordering state, a sequence of $\text{Fe}^{+3} \text{ Fe}^{+3} \text{ Fe}^{+5} \text{ Fe}^{+3} \text{ Fe}^{+3} \text{ Fe}^{+5}$ exist align the [111] direction of pseudo cubic perovskite structure. The CD in $(\text{Nd}_{1-x}\text{Sm}_x)_{1/3}\text{Sr}_{2/3}\text{FeO}_3$ was detected below Néel temperature, in which three kinds of iron with valence state Fe^{3+} , Fe^{5+} and Fe^{4+} was found. The function of tetravalent iron(low spin) increases from 13 to 66 % as temperature rises. This phenomenon can be interpreted to mean the charge ordering and disordering phase coexist in $(\text{Nd}_{1-x}\text{Sm}_x)_{1/3}\text{Sr}_{2/3}\text{FeO}_3$. Indeed, such CO transition was detected by systematic decrease of a spontaneous magnetization with increase of x in the system of $(\text{Nd}_{1-x}\text{Sm}_x)_{1/3}\text{Sr}_{2/3}\text{FeO}_3$. This result shows that the charge ordering state is realized with strong hybridization between Fe and O atoms. The Néel temperature decreases with the increase of the Sm concentration.