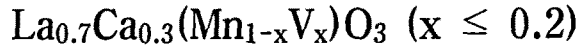


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Spin freezing behavior in polycrystalline



K. H. Han, S. Y. Park, K. K. Yu, J. S. Park, and Y. P. Lee

Quantum Photonic Science Research Center and Department of Physics, Hanyang University, Seoul, 133-791 Korea

The spin-freezing behavior of the vanadium (V)-doped polycrystalline for $\text{La}_{0.7}\text{Ca}_{0.3}\text{Mn}_{1-x}\text{V}_x\text{O}_3$ ($x \leq 0.2$) was investigated. Temperature dependences of the magnetization and the coercivity of samples were measured by vibrating-sample magnetometer. The spin-glass-like phenomenon has been observed for the V-doped samples. For $x = 0.2$, the zero-field-cooled and field-cooled curve exhibit the λ -shape-like behavior, suggesting the possibility of a spin-glass nature. The high-temperature ($160 < T < 300$ K) magnetization data were fitted according to the Curie-Weiss law. The values of $\text{Mn}^{3+}/\text{Mn}^{4+}$ ratio and average spin $\langle S \rangle$ are determined to be (0.7/0.3, 1.86), (0.45/0.55, 1.73) and (0.17/0.83, 1.61) for samples $x = 0, 0.1$ and 0.2 , respectively. The obtained average $\langle S \rangle$ and $\text{Mn}^{3+}/\text{Mn}^{4+}$ ratio for sample $x = 0$ show good agreement with that of $\text{La}_{0.65}(\text{PbCa})_{0.35}\text{MnO}_3$ [1] and the numbers of Mn^{3+} and Mn^{4+} ions per the formula unit of $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$, respectively. The temperature dependence of magnetization behaves to match with that of the coercivity below the Curie temperature. It is suggested that the temperature dependence of coercivity for $\text{La}_{0.7}\text{Ca}_{0.3}\text{Mn}_{0.9}\text{V}_{0.1}\text{O}_3$ is related to coexistence of the ferromagnetic and the antiferromagnetic orders, which is induced by the V doping at the Mn sites.

[Reference]

1. J. Z. Liu, I. C. Chang, S. Irons, P. Klavins, R. N. Shelton, K. Song and S. R. Wasserman, Appl. Phys. Lett. 66 (1995) 3218.