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Magnetic Properties of Vanadium-doped $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$ K. H. HAN, S. Y. PARK, K. K. YU, J. S. PARK, Y. P. LEE, Quantum Photonic Science Research Center and Department of Physics, Hanyang University, Seoul, 133-791 Korea — The magnetic properties of $\text{La}_{0.7}\text{Ca}_{0.3}\text{Mn}_x\text{V}_{1-x}\text{O}_3$ (LCMVO) were investigated. Polycrystalline LCMVO samples were synthesized by the standard solid-state reaction. The Curie temperature was found to decrease with increasing the content of vanadium. The spin-glass-like phenomenon has been observed in the V-doped samples. A sharp drop of the zero-field-cooled magnetization at $T \sim 80$ K implies a spin-freezing behavior. The temperature dependence of coercivity for $\text{La}_{0.7}\text{Ca}_{0.3}\text{Mn}_{0.9}\text{V}_{0.1}\text{O}_3$ shows a cusp at about 80 K, which is almost identical to the aforementioned spin-freezing temperature. The effective anisotropy energy of magnetic clusters in the samples was also estimated from the initial magnetization curves. 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 anti-ferromagnetic orders, which is induced by the V doping at the Mn sites.

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