Magnetic Properties of Vanadium-doped La$\textit{0.7}Ca\textit{0.3}$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 La$_{0.7}$Ca$_{0.3}$Mn$_x$V$_{1-x}$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 La$_{0.7}$Ca$_{0.3}$Mn$_{0.9}$V$_{0.1}$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 La$_{0.7}$Ca$_{0.3}$Mn$_{0.9}$V$_{0.1}$O$_3$ is related to coexistence of the ferromagnetic and the antiferromagnetic orders, which is induced by the V doping at the Mn sites.

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