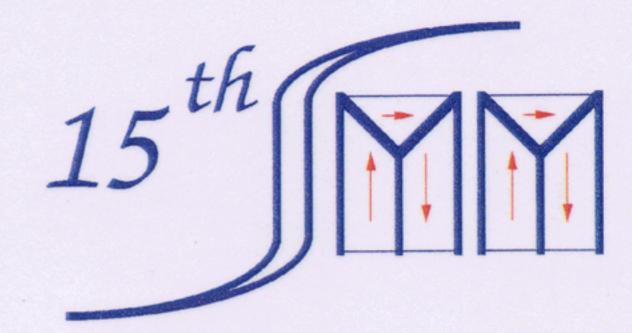
Bilbao, 5-7 September 2001

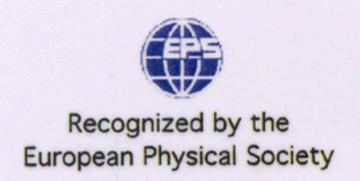


Soft Magnetic Materials Conference

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BOOK OF ABSTRACTS





Mössbauer studies of iron doped La_{0.67}Sr_{0.33}Mn_{0.99}⁵⁷Fe_{0.01}O₃

Chul Sung Kim, In-Bo Shim, Sung Baek Kim, and Geun Young Ahn,

Department of Physics, Kookmin University, Seoul 136-702, Korea,

The iron–doped perovskite La_{0.67}Sr_{0.33}Mn_{0.99}⁵⁷Fe_{0.01}O₃ compound has been studied by x-ray diffraction, Mössbauer spectroscopy, and vibrating sample magnetometry. The single phase of the polycrystalline La_{0.67}Sr _{0.33}Mn_{0.99}⁵⁷Fe_{0.01}O₃ powder have been prepared by a water–based sol–gel method. Crystalline La_{0.67}Sr_{0.33}Mn_{0.99}⁵⁷Fe_{0.01}O₃ was a rombohedral structure with lattice parameters $a_0 = 5.480$ Å, $\alpha = 60.259$ °. Mössbauer spectra of La_{0.67}Sr_{0.33}Mn_{0.99}⁵⁷Fe_{0.01}O₃ have been taken at various temperatures ranging from 20 to 400 K. Analysis of ⁵⁷Fe Mössbauer sprctrum has considered anisotopic hyperfine field fluctuation. Temperature dependence of anisotropy energy is calculated from the relaxation rate. The saturation magnetization of La_{0.67}Sr_{0.33}Mn_{0.99}⁵⁷Fe_{0.01}O₃ is found to be 60.15 emu/g at room temperature. The Curie temperature, $T_{\rm C}$, is determined to be 375 K. The temperature dependence of the resistance under zero and 10 kOe applied field shows that a semiconductor–metal transition, $T_{\rm SC-M}$, occurs at 252 K. The relative magnetoresistance, MR, is about 36.2 %.