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**Abstracts**

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**23-P-03-29****EFFECT OF SIZE MISMATCH OF A-SIZE CATIONS ON  $T_c$  IN MANGANESE OXIDE PEROVSKITES**

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Making use of specimens prepared by Sol-gel technique, the effect of A-site ionic radius  $\langle r_A \rangle$  and A-site cation disorder parameter  $\sigma^2(r_A)$  on Curie temperature  $T_c$  of  $\text{La}_{0.7}\text{A}_{0.3}\text{MnO}_3$  (A=Ca, Sr, Ba) systems were investigated. The samples with equal radius  $\langle r_A \rangle$  and doping level  $x$  have different properties, depending on whether ions with largely different or almost equal radii are used. Besides  $\langle r_A \rangle$ , the cation-size disorder parameter,  $\sigma^2(r_A) = \sum x_i r_i^2 - R_0^2$  may also play an important role. where  $x$  is the fractional occupancy and  $r_i$  is the ionic radius of the corresponding species and  $R_0 = \sum x_i r_i$ . In this paper, we have studied this role by altering the ionic radii of the A-site ions, at constant electronic doping. Also we have calculated ionic radii at constant coordination numbers using tabulated values. The  $T_c$  was measured by a vibrating sample magnetometer (VSM). After 5% and 10% Nd was doped in rare-earth element site of  $\text{La}_{0.3}\text{A}_{0.3}\text{MnO}_3$  (A=Ca, Sr, Ba), the  $T_c$  of  $\text{La}_{0.3}\text{A}_{0.3}\text{MnO}_3$  increased sharply and linearly for A=Ca, (Ca, Sr) with increment of  $\langle r_A \rangle$ , and reached a maximum for A=Sr, and then for  $\text{A}_{0.3} = \text{Sr}_{0.2}\text{Ba}_{0.1}$ , (Sr, Ba),  $\text{Sr}_{0.1}\text{Ba}_{0.2}$  the  $T_c$  decreased slowly. In this region, we clearly observed the role of  $\sigma^2(r_A)$ .

**23-P-03-30****MÖSSBAUER STUDIES OF  $(\text{La}_{0.6}\text{Sr}_{0.4}\text{MnO}_3)_{0.7}(\text{La}_{0.67}\text{Sr}_{0.33}\text{FeO}_3)_{0.3}$  SYSTEM**Chul Sung Kim<sup>a)</sup>, Young Rang Uhm<sup>a)</sup>, Yoon Sung Hyun<sup>b)</sup>, and Young Suk Cho<sup>a)</sup><sup>a)</sup>Department of Physics, Kookmin University, Seoul 136-702, Korea

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The combined system of  $(\text{La}_{0.6}\text{Sr}_{0.4}\text{MnO}_3)_{0.7}(\text{La}_{0.67}\text{Sr}_{0.33}\text{FeO}_3)_{0.3}$  powder with different grain size were fabricated by a sol-gel method. Their inter-magnetic properties were investigated by Mössbauer spectroscopy. A mixture of powder was annealed at 800 °C. The XRD pattern of powder indicates no evidence of reaction between the  $\text{La}_{0.6}\text{Sr}_{0.4}\text{MnO}_3$  (LSMO) and  $\text{La}_{0.67}\text{Sr}_{0.33}\text{FeO}_3$  (LSFO). As added LSFO,  $T_c$  and magnetization at low temperature are lower.  $^{57}\text{Fe}$  Mössbauer spectra patterns of combined system are quite different from that of LSFO. Magnetic hyperfine field of the combined system with 543, 520, and 296 kOe is higher than that of LSFO with 539, 514, and 273 kOe at 18 K, respectively. Their values have slowly varying below 230 K, and then absorption area decrease rapidly. The line-width of spectra is more broadening as temperature increases. Under an applied field of 1T, the MR ratio of combined system with different-grain-sized shows 7 % at 280 K and 5 % at 290 K.