# Lanthanum and Calcium Deficiency of $La_{0.8}Ca_{0.2}Mn_{0.975}O_{3.05}$ on Magnetocaloric Effect

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Perovskite manganite has attracted to explore on magnetocaloric effect due to manganites are relatively easy to synthesize, are tunable by adjustment of the doping concentration, and are considered promising candidates for magnetic refrigeration at various temperatures. Rare-earth doped manganite in general formula of $R_{1-x}M_xMnO_3$ ($R$ = La, Pr, Nd, etc., and $M$ = Ca, Sr, Ba, etc.) exhibit a rich variety of magnetic phenomena especially magnetocaloric effect. Recently, deficiency of manganite has reported influence the magnetocaloric effect. In this work we purpose another series of deficiency of perovskite manganite and investigate their magnetic behavior using vibrating sampel magnetometer (VSM). $La_{0.8}Ca_{0.2}Mn_{0.975}O_{3.05}$ and $(La_{0.8}Ca_{0.2})_{0.975}Mn_{0.975}O_{3.05}$ polycrystal was made using conventional solid state reaction and were investigated of their magnetocaloric effect (MCE). Curie temperature of $La_{0.8}Ca_{0.2}Mn_{0.975}O_{3.05}$ was 191 oK with entropy change $\Delta S_{max}$ = 1.76 $J{\cdot}kg^{-1}{\cdot}K^{-1}$ which behave first order transition. On the other hand Curie temperature of $(La_{0.8}Ca_{0.2})_{0.975}Mn_{0.975}O_{3.05}$ was 146 $^oK$ with entropy change $\Delta S_{max}$ = 0.96 $J{\cdot}kg^{-1}{\cdot}K^{-1}$ which behave second order transition. Deficiency of both lanthanum and calcium play role in curie temperature and phase transition thus will influence their maganetocaloric effect. Different phase transition due to the deficiency both lanthanum and calcium presumably come from lattice parameter and some local defect in polycrystals specimen.