

## Large magnetocaloric effect in $\text{La}_{0.845}\text{Sr}_{0.155}\text{Mn}_{1-x}\text{M}_x\text{O}_3$ ( $\text{M}=\text{Mn}, \text{Cu}, \text{Co}$ ) perovskites

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Recently, a number of our works involving magneto-caloric (MC) effect, which is defined as an adiabatic temperature change of a magnetic substance, related to the change of magnetic entropy caused by the application of an external magnetic field, in manganese oxide materials have been reported, since, a practical point of view, the possibility of using these materials as active magnetic refrigerants in advanced magnetic refrigerators [1-3].

In this issue, we present here, the results of an investigation on the magneto-caloric effect in the perovskites of  $\text{La}_{0.845}\text{Sr}_{0.155}\text{Mn}_{1-x}\text{M}_x\text{O}_3$  ( $\text{M}=\text{Mn}, \text{Cu}, \text{Co}$ ). We have found a large magnetic entropy change, i.e. a large magneto-caloric effect, in all the investigated samples. Among them, the magnetic entropy change reaches a maximum value of 2.67 J/kg K at the applied field of 13.5 kOe for the Cu-doped sample, suggesting that this material would be a suitable candidate for the advanced magnetic refrigeration technology. The large magnetic entropy change produced by the abrupt reduction of magnetization is attributed to the strong coupling between spin and lattice in the vicinity of the ferromagnetic-paramagnetic transition temperature ( $T_C$ ) – which is reasonably verified by electron paramagnetic resonance study.

### References

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- [3] M.H. Phan *et al.*, *Physica B* **327**, 221 (2003).