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Effects of Sr-doping on the giant magnetocaloric effect of  $\text{EuTiO}_3$ 

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**Abstract**

The magnetic properties and magnetocaloric effect of  $\text{Eu}_{1-x}\text{Sr}_x\text{TiO}_3$  ( $x=0-0.1$ ) compounds are investigated. With slight Sr-doping, the ferromagnetic (FM) coupling significantly increased and FM exchange is dominant in the delicate balance. A giant reversible magnetocaloric effect (MCE) and large refrigerant capacity (RC) for  $\text{Eu}_{1-x}\text{Sr}_x\text{TiO}_3$  compounds were observed. The values of  $-\Delta S_M^{\max}$  are evaluated to be around 10 J/kg K under a magnetic field change of 1T and 21 J/kg K under a magnetic field change of 2 T, respectively. But, the values of RC are increased with the more Eu in  $\text{EuTiO}_3$  to be substituted by Sr. Therefore, the giant reversible MCE and large RC make the  $\text{Eu}_{1-x}\text{Sr}_x\text{TiO}_3$  compound a good candidate for magnetic refrigerant working at low-temperature and low-field.

**Keywords:** magnetocaloric effect; magnetic entropy change; refrigerant capacity

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