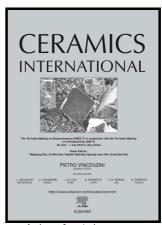
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ACCEPTED MANUSCRIPT

Effects of Sr-doping on the giant magnetocaloric effect of EuTiO₃

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Abstract

The magnetic properties and magnetocaloric effect of Eu_{1-x}Sr_xTiO₃ (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 $Eu_{1-x}Sr_xTiO_3$ 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 EuTiO₃ to be

substituted by Sr. Therefore, the giant reversible MCE and large RC make the Eu_{1-x}Sr_xTiO₃ 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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