

Accepted Manuscript

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PII: S0925-8388(17)33760-X

DOI: [10.1016/j.jallcom.2017.11.015](https://doi.org/10.1016/j.jallcom.2017.11.015)

Reference: JALCOM 43708

To appear in: *Journal of Alloys and Compounds*

Received Date: 13 July 2017

Revised Date: 19 October 2017

Accepted Date: 2 November 2017

Please cite this article as: Y. Bai, F. Han, S. Xie, J. Li, S. Qin, J. Li, L. Qiao, D. Guo, Thickness dependence of electrocaloric effect in high-temperature sintered $\text{Ba}_{0.8}\text{Sr}_{0.2}\text{TiO}_3$ ceramics, *Journal of Alloys and Compounds* (2017), doi: 10.1016/j.jallcom.2017.11.015.

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Thickness dependence of electrocaloric effect in high-temperature sintered $\text{Ba}_{0.8}\text{Sr}_{0.2}\text{TiO}_3$ ceramics

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Abstract. This paper demonstrated the thickness dependence of electrocaloric effect (ECE) in $\text{Ba}_{0.8}\text{Sr}_{0.2}\text{TiO}_3$ ferroelectric ceramics. The high-temperature sintered sample has inhomogeneous properties along the thickness direction although the microstructure has uniform features throughout. The core zone exhibits a much lower resistivity than that of the whole sample because of more ions' valence variation. Under a same electric field of 30kV/cm, the ECE ΔT drops from 1.35K to 1.12K by reducing the thickness step by step. But the thinnest core sample can sustain much higher electric fields (>50kV/cm) and exhibits a larger ΔT of 1.67K, i.e. it has a high ECE value despite a low ECE strength.

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