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Thickness dependence of electrocaloric effect in high-temperature sintered $Ba_{0.8}Sr_{0.2}TiO_3$ ceramics

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Abstract. This paper demonstrated the thickness dependence of electrocaloric effect (ECE) in $Ba_{0.8}Sr_{0.2}TiO_3$ 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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