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The energy-storage performances in (1-x)($Na_{0.5}Bi_{0.5}$)TiO_3–x$SrZrO_3$ ceramics

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In step with the development of energy storage technology and the power electronics industry, dielectric materials with high energy density are in high demand. In this work (1-x)$Na_{0.5}Bi_{0.5}TiO_3$–x$SrZrO_3$ (NBT–SZ) ceramics were synthesized by conventional solid state sintering method range from 1100 to 1250 ^oC. Their crystal structure, microstructure, dielectric, ferroelectric and energy storage properties were investigated and compared. Results show that all prepared sample are single phase without secondary phase. Meanwhile, those grain size decrease with increasing doping SZ content. It was found that those ceramics dielectric permittivity decrease with increasing SZ content, meanwhile exhibiting relaxor behavior. The highest recoverable energy density of 1.7 J/cm^3 under 20 MV/m was achieved in the sample with 6 mol.% SZ content, which also displayed good energy-storage stability in the temperature range from room temperature to 150 ^oC. Simultaneously, the leakage current was largely reduced due to the addition of SZ.