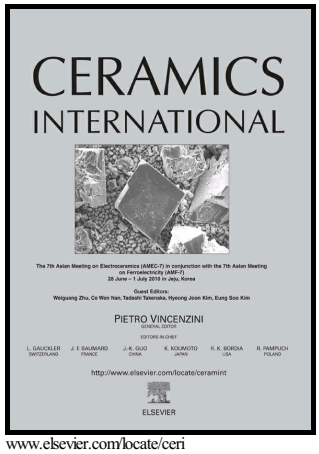

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Abstract: [$0.9(0.94Na_{0.5}Bi_{0.5}TiO_3\text{-}0.06BaTiO_3)\text{-}0.1NaNbO_3$]-xZnO (NBT-BT-NN-xZnO, x=0, 0.5 wt.%, 1.0 wt.%, 1.5 wt.%, and 2.0 wt.%) ferroelectric ceramics were fabricated using a conventional solid-state reaction method. The effects of ZnO content on dielectric, energy-storage and discharge properties were systematically investigated. Dielectric constant and difference between maximum and remanent polarization were significantly improved by ZnO doping. Dielectric constant of NBT-BT-NN-1.0-wt.% ZnO was 3218 at 1 kHz and room temperature, i.e. one time bigger than that of pure NBT-BT-NN ceramic. As a consequence, a maximum energy-storage density of 1.27 J/cm^3 with a corresponding efficiency of 67% was obtained in NBT-BT-NN-1.0-wt.% ZnO ceramic. Moreover, its pulsed discharge energy density was 1.17 J/cm^3, and 90% of which could be released in less than 300 ns. Therefore, ZnO doped NBT-BT-NN ceramic with a large energy-storage density and short release time could be a potential candidate for applications in high energy-storage capacitors.

Keywords: $Na_{0.5}Bi_{0.5}TiO_3$; Dielectric property; Energy-storage performance; Discharge property

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