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0-3 type magnetoelectric $0.94Na_{0.5}Bi_{0.5}TiO_3$-$0.06BaTiO_3$:$CoFe_2O_4$ composite ceramics with a deferred thermal depolarization

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Abstract

Developing $Na_{0.5}Bi_{0.5}TiO_3$-based magnetoelectric (ME) coupling composites with higher depolarization temperature is highly valuable for the environment-friendly smart electronic devices. We have developed a new kind of 0-3 type $0.94Na_{0.5}Bi_{0.5}TiO_3$-$0.06BaTiO_3$:$x CoFe_2O_4$ **(**NBTBT:*x*CFO, *x*=0, 0.1, 0.2, 0.3) composite ceramics with a deferred depolarization temperature, together with an additional strong ME coupling of 9.2 mV/cm·Oe for the NBTBT:0.2CFO. The basic structure, ferroelectric/ferromagnetic properties, and the depolarization temperature of the NBTBT:*x*CFO composite ceramics were investigated. It was found that an enhancement of depolarization temperature (>25^{o}C) was obtained in these 0-3 type composites relative to the pure NBTBT ones (115^{o}C *vs* 90^{o}C). The mechanism of the