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Ultrahigh ferroelectric response in Fe modified $0.95(Na_{1/2}Bi_{1/2})TiO_3$-$0.05BaTiO_3$ single crystals

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Ferroelectric properties of pure NBBT5 single crystals.

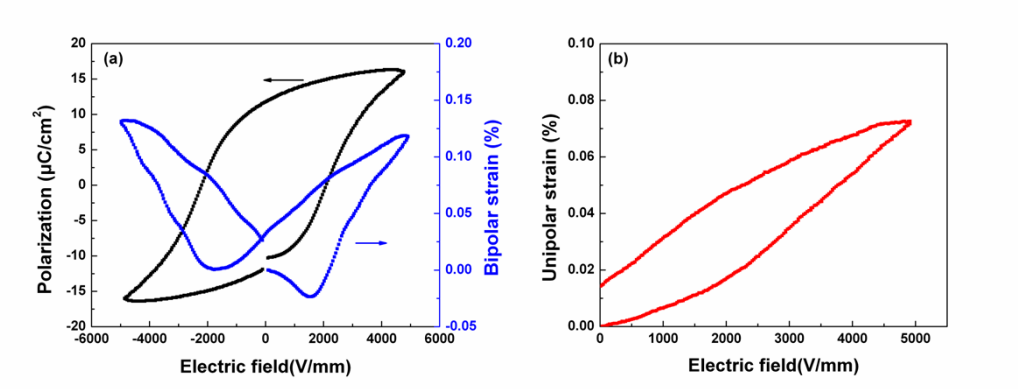

Fig. **s1.** Ferroelectric properties of pure NBBT5 single crystals: (a) the polarization-electrical field (*P-E*) hysteresis loop and bipolar strain-electrical field (*S-E*) curve; (b) unipolar strain-electrical field (ε-*E*) curves.

Fig. s1 shows *P-E* hysteresis loop and bipolar strain-electrical field (*S-E*) curve for pure NBBT5 single crystal. The values of P_r, E_c and S_{max} are 11.8 μC/cm^2, 2.2 kV/mm and 0.12, respectively. With respect to iron doped single crystals, the P-E hysteresis is not well saturated and the S-E curve is not asymmetric, which may be mainly attributed to the relative large leakage current density. Similar phenomena were also observed in NBT-BT single crystals grown using other methods.[1-3] Besides, an anhysteretic ε-*E* curve was observed for pure NBBT5 single crystals. The values of normalized strain $\varepsilon_{max}/E_{max}$ is 249.6 pm/V.

Reference

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