Supplementary Materials

Reversible phase transitions and enhanced electrostrain in BNST-*x*FN ceramics under electric and thermal stimuli

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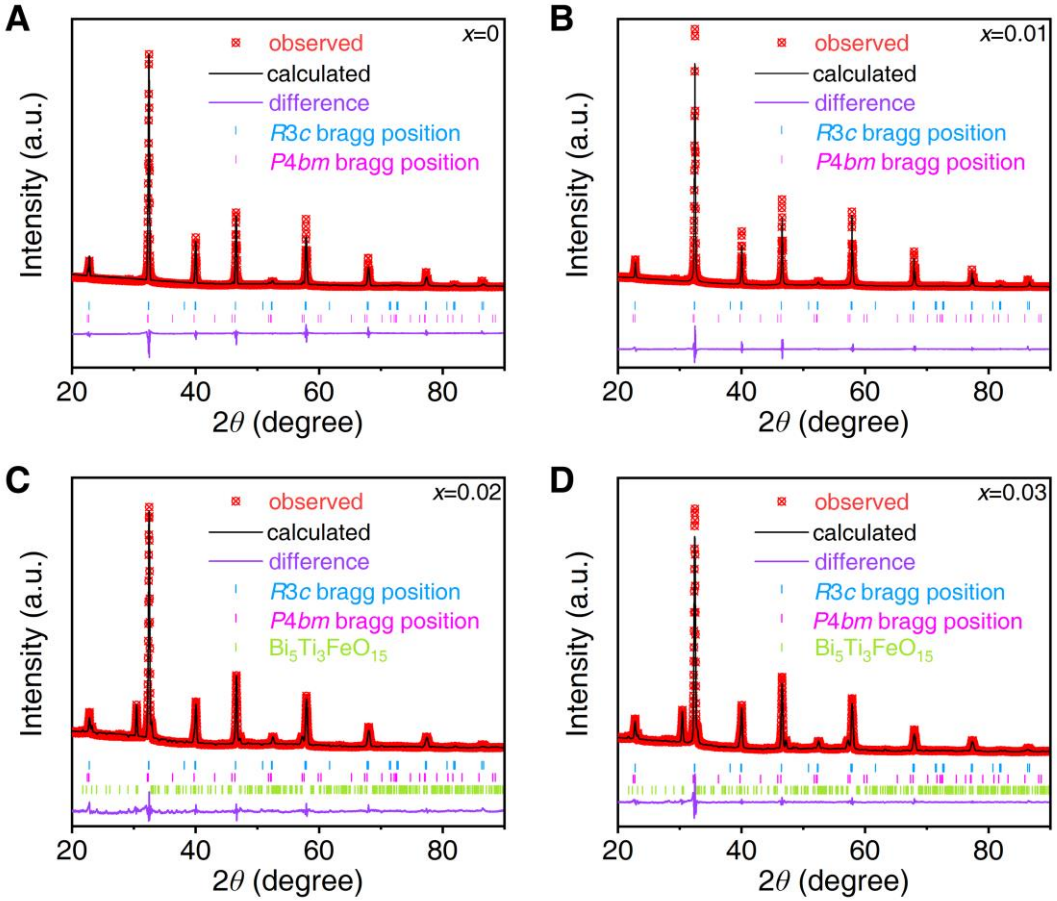

Fig. S1 Fitted X-ray diffraction profiles of BNST-*x*FN ceramics. (A) $x = 0$; (B) $x = 0.01$; (C) $x = 0.02$; (D) $x = 0.03$.

Table S1 Rietveld crystal refinement data of BNST-*x*FN ceramic samples.

Chemical formula	$x = 0$		$x = 0.01$	
Crystal system	Rhombohedral	Tetragonal	Rhombohedral	Tetragonal
Space group	*R*3*c*	*P*4*bm*	*R*3*c*	*P*4*bm*
Unit cell dimensions	$a = 5.4857(6)$ Å	$a = 5.4881(8)$ Å	$a = 5.4818(9)$ Å	$a = 5.4891(5)$ Å
	$b = 5.4857(6)$ Å	$b = 5.4881(8)$ Å	$b = 5.4818(9)$ Å	$b = 5.4891(5)$ Å
	$c = 13.3989(0)$ Å	$c = 3.9223(4)$ Å	$c = 13.4123(6)$ Å	$c = 3.8809(6)$ Å
Volume	349.200 (Å^3)	118.142 (Å^3)	349.057 (Å^3)	116.936 (Å^3)
Density	8.784 g/cm^3	5.956 g/cm^3	8.788 g/cm^3	6.018 g/cm^3
Phase content	0.601	0.399	0.464	0.536
Factors	$R_{wp} = 0.091$		$R_{wp} = 0.080$	
	$\chi^2 = 1.45$		$\chi^2 = 1.12$	
	$R_p = 0.021$		$R_p = 0.021$	

Chemical formula	$x = 0.02$			$x = 0.03$		
Crystal system	Rhombohedral	Tetragonal	$Bi_5Ti_3FeO_{15}$	Rhombohedral	Tetragonal	$Bi_5Ti_3FeO_{15}$
Space group	*R*3*c*	*P*4*bm*		*R*3*c*	*P*4*bm*	
Unit cell dimensions	$a = 5.5273(7)$ Å	$a = 5.5617(4)$ Å	$a = 5.4658(1)$ Å	$a = 5.5218(7)$ Å	$a = 5.5358(4)$ Å	$a = 5.4636(3)$ Å
	$b = 5.5273(7)$ Å	$b = 5.5617(4)$ Å	$b = 5.4437(2)$ Å	$b = 5.5218(7)$ Å	$b = 5.5358(4)$ Å	$b = 5.4429(4)$ Å
	$c = 13.4978(8)$Å	$c = 3.8822(5)$ Å	$c = 40.9224(8)$ Å	$c = 13.5185(6)$ Å	$c = 3.8968(3)$ Å	$c = 40.9973(4)$ Å
Volume	357.136 (Å^3)	120.089 (Å^3)	1217.622 (Å^3)	356.971 (Å^3)	119.420 (Å^3)	1219.188 (Å^3)
Density	8.589 g/cm^3	5.86 g/cm^3	8.098 g/cm^3	8.593 g/cm^3	5.892 g/cm^3	8.087 g/cm^3
Phase content	0.482	0.503	0.069	0.393	0.529	0.078
Factors		$R_{wp} = 0.065$			$R_{wp} = 0.058$	
		$\chi^2 = 0.74$			$\chi^2 = 0.62$	
		$R_p = 0.021$			$R_p = 0.021$	