Supplementary Information

Ultrahigh Energy Storage Performance in (Bi,Na)TiO_3-Based Relaxor Ferroelectrics via Multi-Scale High-Entropy Design

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Table S1 ΔS_{config} of the ceramics.

composition	ΔS_{config}
BNBT	0.879R
BNBT-SBT	1.204R
BNBT-SBT-0.10BLNM	1.713R
BNBT-SBT-0.15BLNM	1.902R
BNBT-SBT-0.20BLNM	1.998R

Table S2 Riveted refinement parameters of the ceramics.

Composition	Space group	Weight Fraction/ %	Lattice parameters	V/Å^3	R_{wp}/%	λ^2
BNBT	*P*4*bm*	84.76	a=b=5.5316Å,c=3.9257Å	120.121	8.70	1.24
	*R*3*c*	15.24	a=b=5.5155Å,c=13.6084Å	358.511		
BNBT-SBT	*P*4*bm*	89.83	a=b= 5.5260Å,c=3.9366Å	120.211	9.40	1.81
	*R*3*c*	10.17	a=b=5.4988 Å,c=13.5414Å	354.593		
BNBT-SBT-0.10BLNM	$Pm\bar{3}m$	97.74	a=b=c= 3.8826Å	58.529	8.39	1.67
	$Fd\bar{3}m$	2.26	a=b=c= 10.3519Å	1109.329		
BNBT-SBT-0.15BLNM	$Pm\bar{3}m$	95.87	a=b=c= 3.8801Å	58.416	7.62	1.49
	$Fd\bar{3}m$	4.13	a=b=c= 10.3539Å	1109.972		
BNBT-SBT-0.20BLNM	$Pm\bar{3}m$	94.22	a=b=c= 3.8775Å	58.298	9.12	1.53
	$Fd\bar{3}m$	5.78	a=b=c= 10.3556Å	1110.519		

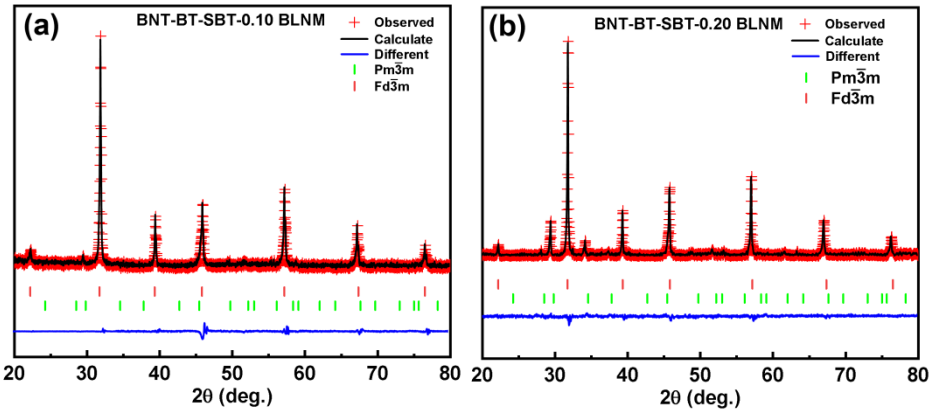

Fig. S1 XRD Rietveld refinements of the ceramics: (a) BNBT-SBT-0.10BLNM, (b) BNBT-SBT-0.20BLNM.

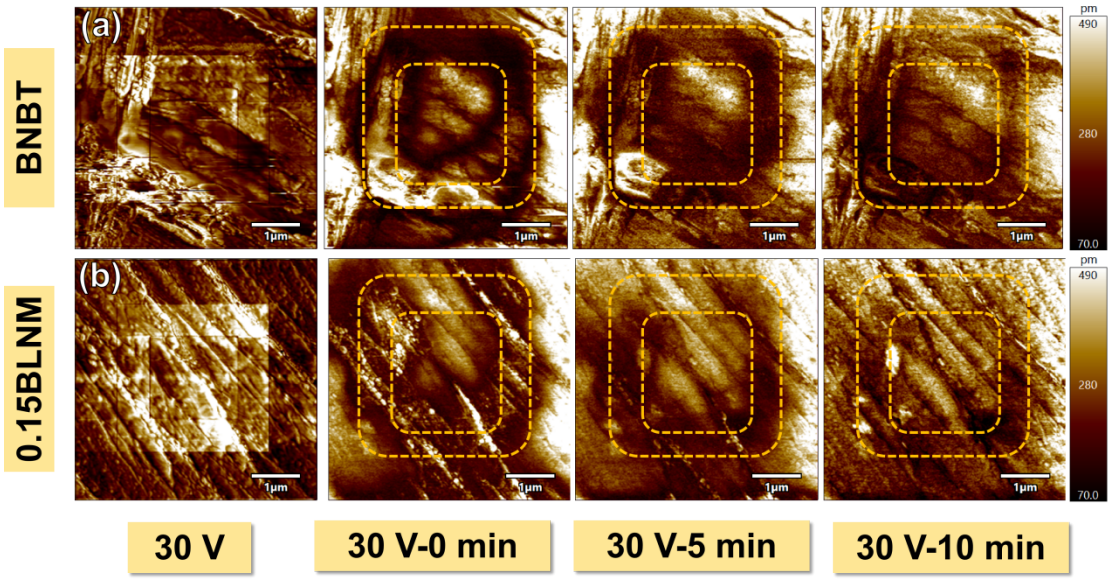

Fig. S2 PFM amplitude images for (a) BNBT and (b) BNBT-SBT-0.15BLNM.

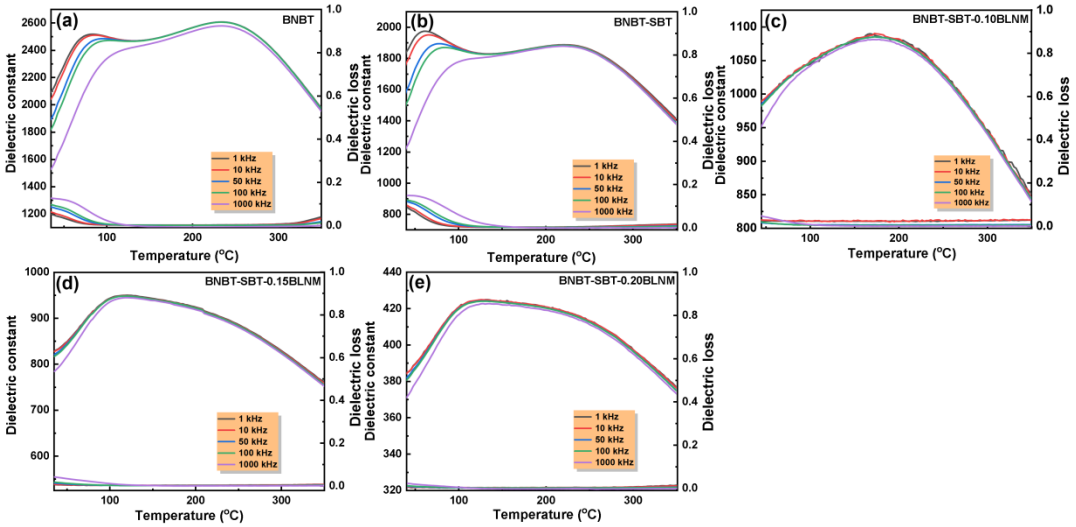

Fig. S3 Temperature-dependent dielectric constant and loss for the ceramics at 1-1000 kHz: (a) BNBT, (b) BNBT-SBT, (c) BNBT-SBT-0.10BLNM, (d) BNBT-SBT-0.15BLNM, (e) BNBT-SBT-0.20BLNM.

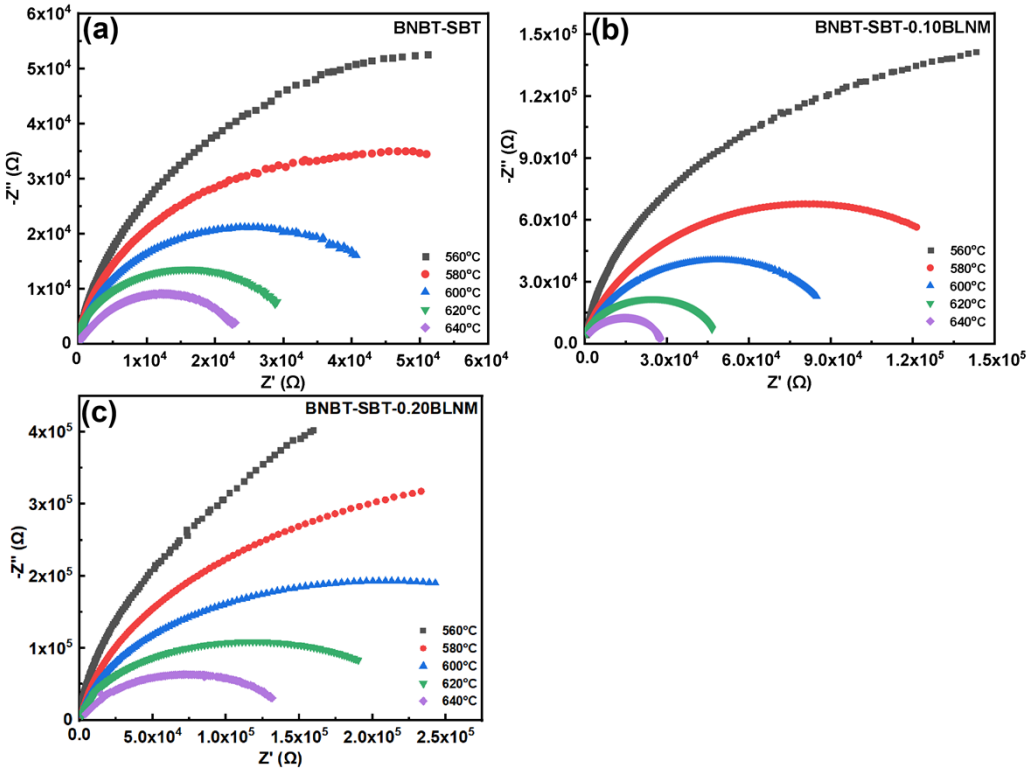

Fig. S4 Complex impedance spectra of the ceramics at 560-640 °C: (a) BNBT-SBT, (b) BNBT-SBT-0.10BLNM, (c) BNBT-SBT-0.20BLNM.

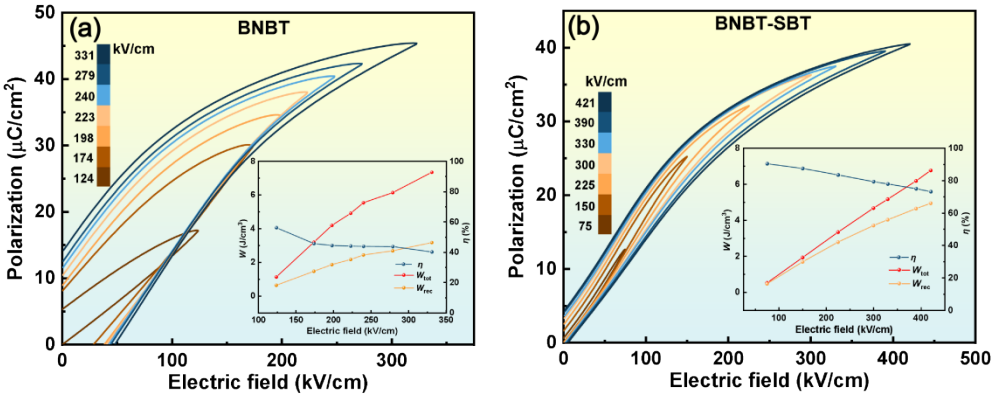

Fig. S5 *P-E* loops, W_{rec}, and η under various electric fields: (a) BNBT; (b) BNBT-SBT.