Supporting Information for

Moderate Fields, Maximum Potential: Achieving High Records with Temperature-Stable Energy Storage in Lead-Free BNT-Based Ceramics

Wenjing Shi[1], Leiyang Zhang[1], Ruiyi Jing[1], Yunyao Huang[1], Fukang Chen[2], Vladimir Shur[3], Xiaoyong Wei[1], Gang Liu[2, *], Hongliang Du[4, *], Li Jin[1, *]

[1] Electronic Materials Research Laboratory, Key Laboratory of the Ministry of Education, School of Electronic Science and Engineering, Xi'an Jiaotong University, Xi'an 710049, P. R. China

[2] School of Materials and Energy, Southwest University, Chongqing 400715, P. R. China

[3] School of Natural Sciences and Mathematics, Ural Federal University, Ekaterinburg, 620000, Russia

[4] Multifunctional Electronic Ceramics Laboratory, College of Engineering, Xi'an International University, Xi'an 710077, P. R. China

*Corresponding authors. E-mail: liugang13@swu.edu.cn (Gang Liu), duhongliang@126.com (Hongliang Du), ljin@mail.xjtu.edu.cn (Li Jin)

S1 Experimental Method

Sample Preparation: Convectional solid-state reaction method was used for the preparation of the (1–*x*)BNKT-*x*(2/3ST-1/3BMN) (BNKT-*x*SB) ceramics. High-purity row powder materials, which were manufactured by Sinopharm (Shanghai, China), including Na_2CO_3 (99.8%), K_2CO_3 (99%), Bi_2O_3 (99%), TiO_2 (98%), $SrCO_3$ (99%), MgO (98.5%), and Nb_2O_5 (99.5%) were weighed and mixed with ethanol, and then ball-milled for 24 h. The mixed slurry was dried at 120 °C and calcined at 880 °C for 2 h. After calcination, the pre-synthesized powders were ball-milled and dried again. Subsequently, 5 wt.% polyvinyl alcohol (PVA) solution and moderate deionized water were added to the synthesized powders to form a viscous gelatinous mixture, 5 wt% PVA to deionized water to powder mass ratio 1:4:5, and then repeated twin-rolled for 2 h for the ultra-thin green ceramic sheets around 110 μm. Finally, the sheets were punched into a lot of green sample discs with a diameter of 13 mm. The binder was burned out at 600 °C for 4 h and discs were sintered at 1150 °C for 2 h.

S2 Supplementary Figures and Tables

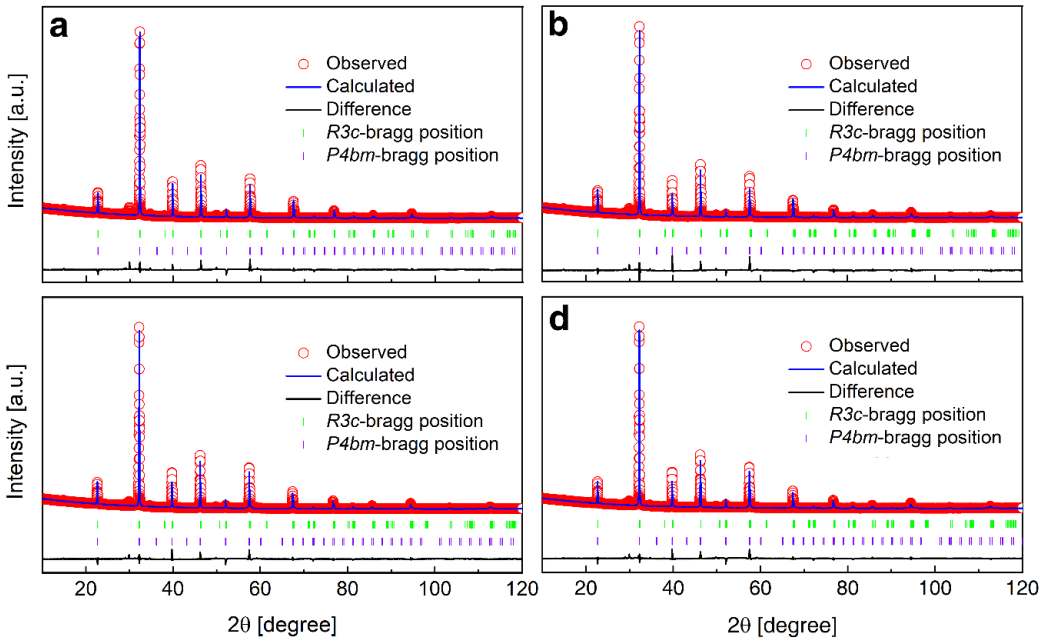

Fig. S1 Fitted X-ray powder diffraction pattern of B-*x*SB ceramics powders of (**a**) *x*=0.35, (**b**) *x* =0.40, (**c**) *x* =0.45 and (**d**) *x* =0.50 in range of 10-120°

Table S1 Energy storage properties of this work compared with other BNT-based bulk ceramics

Composition	E_{max} (kV/cm)	W_{rec} (J/cm^3)	η (%)	Refs.
$[0.94(Bi_{0.5}Na_{0.5})TiO_3$-$0.06BaTiO_3]$-$0.02Ba(Sn_{0.70}Nb_{0.24})O_3$	100	1.28	74	[S1]
$0.7Na_{0.5}Bi_{0.5}TiO_3$-$0.3Sr_{0.7}Bi_{0.2}TiO_3$-0.05Mn	100	1.33	86.2	[S2]
$0.94(0.75Bi_{0.5}Na_{0.5}TiO_3$-$0.25Bi_{0.5}K_{0.5}TiO_3)$-$0.06BiAlO_3$	105	1.15	73.2	[S3]
$0.76Bi_{0.5}Na_{0.5}TiO_3$-$0.24SrTiO_3$-$0.05AgNbO_3$	120	2.03	61.8	[S4]
$(Na_{0.775}K_{0.2}Li_{0.025})_{0.5}Bi_{0.5}Ti_{0.985}Ta_{0.015}O_3$	130	1.29	64.5	[S5]
$Bi_{0.41}Na_{0.35}Sr_{0.21}TiO_3$	135	2.04	82.4	[S6]
$0.8(0.98(0.94Bi_{0.5}Na_{0.5}TiO_3$-$0.06BaTiO_3)-0.02Sr_{0.8}Na_{0.4}Nb_2O_6)$-$0.2NaNbO_3$	140	1.52	82	[S7]
$\{Bi_{0.5}[(Na_{0.8}K_{0.2})_{0.9}Li_{0.1}]_{0.5}\}_{0.96}Sr_{0.04}(Ti_{0.975}Ta_{0.025})O_3$	143	2.42	64	[S8]
$0.7Na_{0.46}Bi_{0.54}TiO_3$-$0.3BaSnO_3$	145.3	1.51	81.2	[S9]
$0.9Na_{0.5}Bi_{0.5}TiO_3$-$0.1BaZn_{1/3}Ta_{2/3}O_3$	150	1.07	71.5	[S10]
$0.86\{0.96(Bi_{0.5}Na_{0.5})(Ti_{0.995}Mn_{0.005})O_3$-$0.04BiAlO_3\}$-$0.14NaNbO_3$	153.8	2.01	71	[S11]
$0.85Na_{0.5}Bi_{0.5}TiO_3$-$0.15BaMg_{1/3}Nb_{2/3}O_3$	155	2.37	81.5	[S12]
$(Bi_{1/2}Na_{1/2})_{0.6}Sr_{0.4}Ti_{0.98}(Fe_{1/2}Nb_{1/2})_{0.02}O_3$	170	3.36	81	[S13]
$0.85Na_{0.5}Bi_{0.5}TiO_3$-$0.15BaHfO_3$	175	2.1	66.1	[S14]
$0.85Na_{0.5}Bi_{0.5}TiO_3$-$0.15BaMg_{1/3}Ta_{2/3}O_3$	175	2.8	78.67	[S15]
$0.9(0.8Bi_{0.5}Na_{0.5}TiO_3$-$0.2Ba_{0.3}Sr_{0.7}TiO_3)$-$0.1NaNbO_3$	180	2.26	87.34	[S16]

$(0.5Na_{0.5}Bi_{0.5}TiO_3$-$0.5SrTiO_3)$ -1%SnO_2	180	2.35	80	[S17]
$0.45(Bi_{0.5}Na_{0.5})TiO_3$-$0.45(BaZr_{0.3}Ti_{0.7}O_3)$	180	2.62	94	[S18]
$0.94(0.65Bi_{0.5}Na_{0.5}TiO_3$–$0.35Bi_{0.1}Sr_{0.85}TiO_3)$–$0.06K_{0.5}Na_{0.5}NbO_3$	180	2.65	84.6	[S19]
$0.825(Bi_{0.5}Na_{0.5})TiO_3$-$0.05BaTiO_3$-$0.125Bi(Zn_{2/3}Nb_{1/3})O_3$	180	2.83	67	[S20]
$0.7Bi_{0.5}Na_{0.5}TiO_3$-$0.3Sr_{0.7}Nd_{0.2}TiO_3$	182	3.09	77	[S21]
$0.85(Bi_{0.47}La_{0.03}Na_{0.5})_{0.94}Ba_{0.06}TiO_3$-$0.15Sr(Sc_{0.5}Nb_{0.5})O_3$	185	1.83	82.32	[S22]
$0.6Bi_{0.5}Na_{0.5}TiO_3$-$0.4(Sr_{0.775}Bi_{0.15})TiO_3$	190	2.41	89.5	[S23]
$0.75Bi_{0.5}Na_{0.5}TiO_3$-$0.25BaSnO_3$	190	19.1	86.4	[S24]
$(Na_{0.5}Bi_{0.5})_{0.8}Ba_{0.2}Ti_{0.8}Sn_{0.8}O_3$	195	2.35	71.04	[S25]
$0.75Na_{0.25}Sr_{0.5}Bi_{0.25}TiO_3$-$0.25MgO$	200	2.06	84	[S26]
$0.9Na_{0.5}Bi_{0.5}TiO_3$-$0.1Li_2TiO_3$	200	2.3	74.2	[S27]
$0.55Na_{0.5}Bi_{0.5}TiO_3$-$0.45(Bi_{0.2}Sr_{0.7}TiO_3)$	200	2.5	95	[S28]
$Na_{0.5}Bi_{0.5}TiO_3$-$0.3NaNbO_3$	200	2.64	90	[S29]
$0.7\ [0.85BaTiO_3$-$0.15Bi(Mg_{2/3}Nb_{1/3})O_3]$-$0.3Na_{0.5}Bi_{0.5}TiO_3$	200	2.91	85.55	[S30]
$0.9[0.76Bi_{0.5}Na_{0.5}TiO_3$-$0.24NaNbO_3]$-$0.1Sr_{0.7}Bi_{0.2}TiO_3$	200	3.12	75.3	[S31]
$0.6[0.935(Bi_{0.5}Na_{0.5})TiO_3$–$0.065BaTiO_3]$–$0.4Ba(Zr_{0.3}Ti_{0.7})O_3$	210	1.9	86	[S32]
$0.7[0.8Bi_{0.5}Na_{0.5}TiO_3$-$0.2Ba(Zr_{0.3}Ti_{0.7})O_3]$-$0.3Sr_{0.7}La_{0.2}TiO_3$	210	2.6	92.2	[S33]
$0.4Bi_{0.5}Na_{0.5}TiO_3$-$0.6Sr_{0.7}Ca_{0.3}TiO_3$-0.2 wt%MnO_2	210	2.64	70	[S34]
$[Ca_{0.1}(Bi_{0.5}Na_{0.5})_{0.9}](Ti_{0.85}Zr_{0.15})O_3$	210	2.79	76	[S35]
$0.94Bi_{0.5}Na_{0.5}TiO_3$- $0.06BaTiO_3$	210	3	75	[S36]
$0.97Na_{0.5}Bi_{0.5}TiO_3$-$0.03LaAlO_3$	210	3.18	60	[S37]
0.775 $Bi_{0.5}Na_{0.5}TiO_3$-0.225 $BaSnO_3$-5 wt% MgO	215	2.13	67.8	[S38]
$0.97[0.5(Bi_{0.5}Na_{0.5})TiO_3$-$0.5SrTiO_3]$-$0.03NaNbO_3$	220	2.34	74.6	[S39]
$0.96(0.65(Bi_{0.5}Na_{0.5})TiO_3$-$0.35Sr_{0.85}Bi_{0.1}TiO_3)$-$0.04NaNbO_3$	220	3.08	81.4	[S40]
$0.5(Bi_{0.5}Na_{0.5})TiO_3$-$0.5SrTiO_3$-1.5 mol% CuO	230	2.2	72.39	[S41]
$0.85(0.95Bi_{0.5}Na_{0.5}TiO_3$–$0.05SrZrO_3)$-$0.15NaNbO_3$	230	3.14	79	[S42]
$0.93(0.45SrTiO_3$–$0.2Na_{0.5}Bi_{0.5}TiO_3$–$0.35BaTiO_3)$–$0.07SnO_2$	240	2.25	79.51	[S43]
$0.84Bi_{0.5}Na_{0.5}TiO_3$-$0.16(Na_{0.73}Bi_{0.09})NbO_3$	240	2.41	81.6	[S44]
$0.9(0.7\ Bi_{0.5}Na_{0.5}TiO_3$-$0.3SrTiO_3)$-0.1 $Bi(Nb_{0.5}Mg_{0.5})O_3$	240	3.46	78	[S45]
$0.8(0.775Na_{0.5}Bi_{0.5}TiO_3$-$0.225BaSnO_3)$-$0.2BaZrO_3$	245	2.08	88.8	[S46]
$0.95(0.6Bi_{0.5}Na_{0.5}TiO_3$–$0.4Sr_{0.7}Bi_{0.2}TiO_3)$-0.05 $AgNbO_3$	246	3.62	89	[S47]
$0.3Bi_{0.5}Na_{0.5}TiO_3$-$0.7Sr_{0.85}Bi_{0.1}TiO_3$	250	2.32	80.1	[S48]
$0.85(Na_{0.5}Bi_{0.5})_{0.7}Sr_{0.3}TiO_3$–$0.15Bi(Mg_{2/3}Nb_{1/3})O_3$	250	3.45	88.01	[S49]

$0.98(Bi_{0.5}Na_{0.5}TiO_3–SrTiO_3)$-$0.02BaBi_2Nb_2O_9$	250	3.97	81	[S50]
$0.76Bi_{0.5}Na_{0.5}TiO_3$-$0.24SrTiO_3$-$Bi(Ni_{2/3}Nb_{1/3})O_3$	250	4.1	83.15	[S51]
$0.6\ Bi_{0.5}Na_{0.5}TiO_3$-$0.4Sr_{0.7}Sm_{0.2}TiO_3$	260	3.52	84.2	[S52]
$0.6(0.8Bi_{0.5}Na_{0.4}K_{0.1}TiO_3$-$0.2SrTiO_3)$-$0.4NaNbO_3$	260	4.44	81.8	[S53]
$0.90(Na_{0.5}Bi_{0.5})_{0.7}Sr_{0.3}TiO_3$-$0.10Bi(Ni_{0.5}Sn_{0.5})O_3$	270	4.18	83.64	[S54]
$0.55\ Bi_{0.5}Na_{0.5}TiO_3$-$0.45(Sr_{0.7}La_{0.2})(Ti_{0.8}Sn_{0.2})O_3$	280	2.52	89.3	[S55]
$0.6(Bi_{0.51}Na_{0.47})TiO_3$-$0.4Ba(Zr_{0.3}Ti_{0.7})O_3$	280	3.1	91	[S56]
$0.94(0.65\ Bi_{0.5}Na_{0.5}TiO_3$-$0.35Sr_{0.7}Bi_{0.2}TiO_3)$-$0.06K_{0.5}Na_{0.5}NbO_3$	280	3.25	93.8	[S57]
$0.88Bi_{0.47}Na_{0.47}Ba_{0.06}TiO_3$-$0.12CaHfO_3$	280	4.2	66.7	[S58]
99.5 mol%$[0.6SrTiO_3$-$0.4Na_{0.5}Bi_{0.5}TiO_3]$-0.5 mol%$ZrO_2$	285	2.84	71.54	[S59]
$0.6(Ba_{0.7}Sr_{0.3})(Zr_{0.2}Ti_{0.8})O_3$-$0.4(Na_{0.5}Bi_{0.5})TiO_3$	289	3.72	94.3	[S60]
$0.85(0.75Na_{0.5}Bi_{0.5}TiO_3$-$0.25SrTiO_3)$-$0.15Ag(Nb_{0.85}Ta_{0.15})O_3$	290	3.6	80	[S61]
$0.85[0.7\ Na_{0.5}Bi_{0.5}TiO_3$-$0.3Bi_{0.1}Sr_{0.85}TiO_3]$-$0.15KNbO_3$	290	3.72	90.7	[S62]
$0.76(0.94Na_{0.5}Bi_{0.5}TiO_3$-$0.06BaTiO_3)$-$0.24(Sr_{0.85}Bi_{0.1})(Mg_{1/3}Nb_{2/3})O_3$	300	3.05	89	[S63]
$0.5\ Na_{0.5}Bi_{0.5}TiO_3$-$0.5Sr_{0.7}Nd_{0.2}TiO_3$	305	3.85	85.3	[S64]
$(Na_{0.25}Bi_{0.25}Sr_{0.5})(Ti_{0.8}Sn_{0.2})O_3$	310	3.4	90	[S65]
$0.55Bi_{0.5}Na0.5TiO_3$-$0.45Sr_{0.7}La_{0.2}TiO_3$	315	4.14	92.2	[S66]
$0.9(0.65\ Bi_{0.5}Na0.5TiO_3$-$0.35Bi_{0.2}Sr_{0.7}TiO_3)$-$0.1CaZrO_3$	330	2.9	80	[S67]
$0.85(0.55Na_{0.5}Bi_{0.5}TiO_3$-$0.45Sr_{0.7}La_{0.2}TiO_3)$-$0.15Bi(Mg_{2/3}Nb_{1/3})O_3$	338	3.88	85	[S68]
$0.65(0.84Bi_{0.5}Na_{0.5}TiO_3–0.16K_{0.5}Bi_{0.5}TiO_3)–0.35(Bi_{0.2}Sr_{0.7}TiO_3)$	350	4.06	87.3	[S69]
$0.91Bi_{0.5}Na_{0.5}TiO_3$-$0.09(0.5Ba_{0.7}Ca_{0.3}TiO_3$-$0.5BaTi_{0.8}Zr_{0.2}O_3)$	360	3.49	64.9	[S70]
$0.88Na_{0.5}Bi_{0.5}TiO_3$-$0.12CaZr_{0.5}Ti_{0.5}O_3$	378.3	4.77	69	[S71]
$0.8(0.65Bi_{0.5}Na_{0.5}TiO_3$-$0.35Bi_{0.2}Sr_{0.7}TiO_3)$-$0.2BaSnO_3$	380	3.75	84.8	[S72]
$0.8Bi_{0.5}Na_{0.5}TiO_3–0.2NaTaO_3$	380	4.21	77.8	[S73]
$0.95(0.9Bi_{0.5}Na_{0.5}TiO_3$-$0.1Ba_{0.85}Ca_{0.15}Zr_{0.1}Ti_{0.9}O_3)$-$0.05BaSnO_3$	385	4.97	84.4	[S74]
$0.85(0.94Bi_{0.5}Na_{0.5}TiO_3$-$0.06BaTiO_3)$-$0.15BiMg_{2/3}Nb_{1/3}O_3$	420	6.3	80	[S75]
$0.5Na_{0.5}Bi_{0.5}TiO_3$-$0.5Sr_{0.85}Sm_{0.1}TiO_3$	422	5.02	90	[S76]
$(Na_{0.5}Bi_{0.5})_{0.7}Sr_{0.3}TiO_3$-$Ba(Mg_{1/3}Nb_{2/3})O_3$	460	5.5	90.1	[S77]
$0.8Bi_{0.5}Na_{0.5}TiO_3$-$0.2SrNb_{0.5}Al_{0.5}O_3$	520	6.64	96	[S78]
$0.75Bi_{(0.58)}Na_{(0.42)}TiO_3$-$0.25SrTiO_3$	535	5.63	94	[S79]

$0.94Bi_{0.55}Na_{0.45}TiO_3$–$0.06BaTiO_3$-$0.80Bi_{0.5}Na_{0.5}TiO_3$–$0.20SrNb_{0.5}Al_{0.5}O_3$	540	6.3	93.61	[S80]
$0.7(0.85Bi_{0.5}Na_{0.5}TiO_3$–$0.15NaNbO_3)$-$0.3(Sr_{1.05}Bi_{0.3})ScO_3$	540	7.3	80	[S81]
$(Bi_{0.5}(Na_{0.8}K_{0.2})_{0.5})_{0.96}Sr_{0.04}Ti_{0.99}Ta_{0.01}O_3$-$0.70Bi_{0.5}Na_{0.5}TiO_3$-$0.30SrNb_{0.5}Al_{0.5}O_3$	572	6.78	89.7	[S82]

Table S2 Characterized and crystal structure fitting parameters and results for (1-*x*)$Bi_{0.5}Na_{0.1}K_{0.1}TiO_3$-*x*($1/3SrTiO_3$-$2/3Bi(Mg_{2/3}Nb_{1/3})O_3$) ceramics

		x=0.35	*x*=0.40	*x*=0.45	*x*=0.50
AGS (μm)		1.60	1.68	1.61	1.66
Density (g/cm^3)		5.62	5.65	5.68	5.66
Crystal system		R+T	R+T	R+T	R+T
Space group		*R3c*+*P4bm*	*R3c*+*P4bm*	*R3c*+*P4bm*	*R3c*+*P4bm*
Cell parameter (Å)	R	*a*=5.5450(6)	*a*=5.5391(9)	*a*=5.5525(4)	*a*=5.5585(1)
		b=5.5450(6)	*b*=5.5391(9)	*b*=5.5525(4)	*b*=5.5585(1)
		c=13.5734(4)	*c*=13.5066(9)	*c*=13.5520(0)	*c*=13.6070(6)
	T	*a*=5.5458(5)	*a*=5.5470(0)	*a*=5.5533(9)	*a*=5.5586(0)
		b=5.5458(5)	*b*=5.5470(0)	*b*=5.5533(9)	*b*=5.5586(0)
		c=3.9207(8)	*c*=3.9204(2)	*c*=3.9287(4)	*c*=3.9308(9)
Volume ($Å^3$)	R	361.44	358.90	361.84	364.09
	T	120.59	120.63	121.15	121.46
Fraction (%)	R	61.76	68.33	70.51	69.13
	T	38.24	31.67	29.49	30.87
R-factor [a]	R_p (%)	6.75	7.33	6.78	6.57
	R_{wp} (%)	9.87	9.56	9.78	9.76
	χ^2 (%)	1.56	1.42	1.60	1.54
No. of profile points used		12001	12001	12001	12001

[a] For the definition of *R*-factor see Ref. [83].

Table S3 Energy storage properties of this work compared with other BNT-based bulk ceramics

Ceramic compositions	E_{max} (kV/cm)	W_{rec} (J/cm^3)	η (%)	Refs.
$0.95(0.6Bi_{0.5}Na_{0.5}TiO_3$-$0.4Sr_{0.7}Bi_{0.2}TiO_3)$-$0.05AgNbO_3$	246	3.62	89	[S84]
$0.75Bi_{0.58}Na_{0.42}TiO_3$-$0.25SrTiO_3$	569	5.63	94	[S79]
$0.76(Bi_{0.5}Na_{0.5})TiO_3$-$0.24NaNbO_3$	200	3.12	75	[S31]
$0.90(Na_{0.5}Bi_{0.5})_{0.7}Sr_{0.3}TiO_3$-$0.10Bi(Ni_{0.5}Sn_{0.5})O_3$	270	4.18	83	[S54]
$(Na_{0.25}Bi_{0.25}Sr_{0.5})(Ti_{0.8}Sn_{0.2})O_3$	310	3.4	90	[S85]
$0.78(Bi_{0.5}Na_{0.5})TiO_3$-$0.22NaNbO_3$	390	7.02	85	[S86]
$0.8SrTiO_3$-$0.2(0.93Bi_{0.5}Na_{0.5}TiO_3$-$0.07Ba_{0.94}La_{0.04}Zr_{0.02}Ti_{0.98}O_3)$	250	2.79	76	[S87]
$[Ca_{0.05}(Bi_{0.5}Na_{0.5})_{0.95}](Ti_{0.85}Zr_{0.15})O_3$	200	3.12	75	[S35]
$Na_{0.25}Sr_{0.5}Bi_{0.25}TiO_3$-$0.25MgO$	170	3.36	81	[S26]
$(Bi_{1/2}Na_{1/2})_{0.6}Sr_{0.4}Ti_{0.98}(Fe_{1/2}Nb_{1/2})_{0.02}O_3$	190	1.67	80	[S13]
$Na_{0.3}Sr_{0.4}Bi_{0.3}TiO_3$-$0.02La$	210	2.15	81	[S88]
$0.85Na_{0.5}Bi_{0.5}TiO_3$-$0.15CaTiO_3$-$0.06La$	280	4.2	66	[S89]
$0.88Bi_{0.47}Na_{0.47}Ba_{0.06}TiO_3$-$0.12CaHfO_3$	290	3.6	80	[S58]
$0.85(0.75Na_{0.5}Bi_{0.5}TiO_3$-$0.25SrTiO_3)$-$0.15Ag(Nb_{0.85}Ta_{0.15})O_3$	270	3.12	88	[S90]
$0.9(Na_{0.4}Bi_{0.4}Ba_{0.06}Sr_{0.14}Ti_{0.99}Ta_{0.01}O_3)$-$0.1NaNbO_3$	290	3.72	91	[S91]
$0.85[0.7Bi_{0.5}Na_{0.5}TiO_3$-$0.3Bi_{0.1}Sr_{0.85}TiO_3]$-$0.15KNbO_3$	569	5.63	94	[S62]
$0.75Bi_{0.4465}Na_{0.4465}Ba_{0.057}La_{0.05}TiO_3$-$0.25Sr_{0.85}Bi_{0.1}TiO_3$	320	4.55	90	[S92]
$0.55Bi_{0.5}Na_{0.5}TiO_3$-$0.45Sr_{0.7}La_{0.2}TiO_3$	338	4.14	92	[S66]
$(1$-$x)Bi_{0.5}Na_{0.5}TiO_3$-$xSrNb_{0.5}Al_{0.5}O_3$	520	6.64	96	[S78]
$0.85(Na_{0.5}Bi_{0.5})_{0.7}Sr_{0.3}TiO_3$-$0.15Bi(Mg_{2/3}Nb_{1/3})O_3$	250	3.45	88	[S93]
$0.85(0.94Bi_{0.5}Na_{0.5}TiO_3$-$0.06BaTiO_3)$-$0.15BiMg_{2/3}Nb_{1/3}O_3$	420	6.3	80	[S75]
$0.5Bi_{0.5}Na_{0.4}K_{0.1}TiO_3$-$0.5(2/3SrTiO_3$-$1/3Bi(Mg_{2/3}Ni_{1/3})O_3)$	460	7.19	93.8	This work

Table S4 Energy storage properties of this work compared with other representative bulk ceramics

Ceramic compositions	E_{max} (kV/cm)	W_{rec} (J/cm^3)	η (%)	Refs.
$0.85Na_{0.35}Bi_{0.35}Sr_{0.3}TiO_3$–$0.15BiMg_{2/3}Nb_{1/3}O_3$	250	3.45	88.01	[S94]
$0.98(Bi_{0.5}Na_{0.5}TiO_3$–$SrTiO_3)$-$0.02BaBi_2Nb_2O_9$	250	3.97	81	[S50]
$0.76Bi_{0.5}Na_{0.5}TiO_3$-$0.24SrTiO_3$-$Bi(Ni_{2/3}Nb_{1/3})O_3$	250	4.1	83.15	[S51]
$0.6\ Bi_{0.5}Na_{0.5}TiO_3$-$0.4Sr_{0.7}Sm_{0.2}TiO_3$	260	3.52	84.2	[S52]
$0.6(0.8Bi_{0.5}Na_{0.4}K_{0.1}TiO_3$-$0.2SrTiO_3)$-$0.4NaNbO_3$	260	4.44	81.8	[S53]
$0.90(Na_{0.5}Bi_{0.5})_{0.7}Sr_{0.3}TiO_3$-$0.10Bi(Ni_{0.5}Sn_{0.5})O_3$	270	4.18	83.64	[S54]
$0.55\ Bi_{0.5}Na_{0.5}TiO_3$-$0.45(Sr_{0.7}La_{0.2})(Ti_{0.8}Sn_{0.2})O_3$	280	2.52	89.3	[S55]
$0.6(Bi_{0.51}Na_{0.47})TiO_3$-$0.4Ba(Zr_{0.3}Ti_{0.7})O_3$	280	3.1	91	[S56]
$0.94(0.65\ Bi_{0.5}Na_{0.5}TiO_3$-$0.35Sr_{0.7}Bi_{0.2}TiO_3)$-$0.06K_{0.5}Na_{0.5}NbO_3$	280	3.25	93.8	[S57]
$0.88Bi_{0.47}Na_{0.47}Ba_{0.06}TiO_3$-$0.12CaHfO_3$	280	4.2	66.7	[S58]
99.5 mol%$[0.6SrTiO_3$-$0.4Na_{0.5}Bi_{0.5}TiO_3]$-0.5 mol%$ZrO_2$	285	2.84	71.54	[S59]
$0.6(Ba_{0.7}Sr_{0.3})(Zr_{0.2}Ti_{0.8})O_3$-$0.4(Na_{0.5}Bi_{0.5})TiO_3$	289	3.72	94.3	[S60]
$0.85(0.75Na_{0.5}Bi_{0.5}TiO_3$-$0.25SrTiO_3)$-$0.15Ag(Nb_{0.85}Ta_{0.15})O_3$	290	3.6	80	[S61]
$0.85[0.7\ Na_{0.5}Bi_{0.5}TiO_3$-$0.3Bi_{0.1}Sr_{0.85}TiO_3]$-$0.15KNbO_3$	290	3.72	90.7	[S62]
$0.76(0.94Na_{0.5}Bi_{0.5}TiO_3$-$0.06BaTiO_3)$-$0.24(Sr_{0.85}Bi_{0.1})(Mg_{1/3}Nb_{2/3})O_3$	300	3.05	89	[S63]
$0.5\ Na_{0.5}Bi_{0.5}TiO_3$-$0.5Sr_{0.7}Nd_{0.2}TiO_3$	305	3.85	85.3	[S64]
$(Na_{0.25}Bi_{0.25}Sr_{0.5})(Ti_{0.8}Sn_{0.2})O_3$	310	3.4	90	[S65]
$0.55Bi_{0.5}Na0.5TiO_3$-$0.45Sr_{0.7}La_{0.2}TiO_3$	315	4.14	92.2	[S66]
$0.9(0.65\ Bi_{0.5}Na0.5TiO_3$-$0.35Bi_{0.2}Sr_{0.7}TiO_3)$-$0.1CaZrO_3$	330	2.9	80	[S67]
$0.85(0.55Na_{0.5}Bi_{0.5}TiO_3$-$0.45Sr_{0.7}La_{0.2}TiO_3)$-$0.15Bi(Mg_{2/3}Nb_{1/3})O_3$	338	3.88	85	[S68]
$0.65(0.84Bi_{0.5}Na_{0.5}TiO_3$–$0.16K_{0.5}Bi_{0.5}TiO_3)$–$0.35(Bi_{0.2}Sr_{0.7}TiO_3)$	350	4.06	87.3	[S69]
$0.91Bi_{0.5}Na_{0.5}TiO_3$-$0.09(0.5Ba_{0.7}Ca_{0.3}TiO_3$-$0.5BaTi_{0.8}Zr_{0.2}O_3)$	360	3.49	64.9	[S70]
$0.88Na_{0.5}Bi_{0.5}TiO_3$-$0.12CaZr_{0.5}Ti_{0.5}O_3$	378.3	4.77	69	[S71]
$0.8(0.65Bi_{0.5}Na_{0.5}TiO_3$-$0.35Bi_{0.2}Sr_{0.7}TiO_3)$-$0.2BaSnO_3$	380	3.75	84.8	[S72]
$0.8Bi_{0.5}Na_{0.5}TiO_3$–$0.2NaTaO_3$	380	4.21	77.8	[S73]
$0.95(0.9Bi_{0.5}Na_{0.5}TiO_3$-$0.1Ba_{0.85}Ca_{0.15}Zr_{0.1}Ti_{0.9}O_3)$-$0.05BaSnO_3$	385	4.97	84.4	[S74]
$0.85(0.94Bi_{0.5}Na_{0.5}TiO_3$-$0.06BaTiO_3)$-$0.15BiMg_{2/3}Nb_{1/3}O_3$	420	6.3	80	[S75]
$0.5Na_{0.5}Bi_{0.5}TiO_3$-$0.5Sr_{0.85}Sm_{0.1}TiO_3$	422	5.02	90	[S76]
$(Na_{0.5}Bi_{0.5})_{0.7}Sr_{0.3}TiO_3$-$Ba(Mg_{1/3}Nb_{2/3})O_3$	460	5.5	90.1	[S77]
$0.8Bi_{0.5}Na_{0.5}TiO_3$-$0.2SrNb_{0.5}Al_{0.5}O_3$	520	6.64	96	[S78]

$0.75Bi_{(0.58)}Na_{(0.42)}TiO_3$-$0.25SrTiO_3$	535	5.63	94	[S79]
$0.94Bi_{0.55}Na_{0.45}TiO_3$–$0.06BaTiO_3$-$0.80Bi_{0.5}Na_{0.5}TiO_3$–$0.20SrNb_{0.5}Al_{0.5}O_3$	540	6.3	93.61	[S80]
$(Bi_{0.5}(Na_{0.8}K_{0.2})_{0.5})_{0.96}Sr_{0.04}Ti_{0.99}Ta_{0.01}O_3$- $0.70Bi_{0.5}Na_{0.5}TiO_3$-$0.30SrNb_{0.5}Al_{0.5}O_3$	572	6.78	89.7	[S82]
$[0.94(Bi_{0.5}Na_{0.5})TiO_3$-$0.06BaTiO_3]$-$0.02Ba(Sn_{0.70}Nb_{0.24})O_3$	100	1.28	74	[S1]
$0.7Na_{0.5}Bi_{0.5}TiO_3$-$0.3Sr_{0.7}Bi_{0.2}TiO_3$-0.05Mn	100	1.33	86.2	[S2]
$0.94(0.75Bi_{0.5}Na_{0.5}TiO_3$-$0.25Bi_{0.5}K_{0.5}TiO_3)$-$0.06BiAlO_3$	105	1.15	73.2	[S3]
$0.76Bi_{0.5}Na_{0.5}TiO_3$-$0.24SrTiO_3$-$0.05AgNbO_3$	120	2.03	61.8	[4S]
$(Na_{0.775}K_{0.2}Li_{0.025})_{0.5}Bi_{0.5}Ti_{0.985}Ta_{0.015}O_3$	130	1.29	64.5	[S5]
$Bi_{0.41}Na_{0.35}Sr_{0.21}TiO_3$	135	2.04	82.4	[S6]
0.91NaNbO3-0.09Bi(Zn0.5Ti0.5)O3	200	2.1	76	[S95]
$NaNbO_3$–$Bi(Mg_{2/3}Nb_{1/3})NbO_3$	300	2.8	82	[S96]
0.80 $NaNbO_3$-0.20 $SrTiO_3$	323	3.02	80.7	[S97]
$0.78NaNbO_3$-$0.22Ba(Mg_{1/3}Nb_{2/3})O_3$	540	3.51	87	[S98]
$Na_{0.7}Bi_{0.1}NbO_3$	250	4.03	85	[S99]
$NaNbO_3$-MnO	360	4.3	90	[S100]
$(Na_{0.84}Bi_{0.08})(Nb_{0.92}Zr_{0.08})O_3$	430	4.9	88	[S101]
$0.9NaNbO_3$-$0.1Bi(Ni_{1/2}Sn_{1/2})O_3$	550	5	68	[S102]
$0.78NaNbO_3$–$0.22Bi(Mg_{2/3}Ta_{1/3})O_3$	620	5.01	86.8	[S103]
$NaNbO_3$–$Bi(Mg_{0.5}Ti_{0.5})O_3$	480	5.57	71	[S104]
$(Na_{0.91}La_{0.09})(Nb_{0.82}Ti_{0.18})O_3$	550	6.5	65.9	[S105]
$0.75[0.90NaNbO_3$–$0.10Bi(Mg_{0.5}Ta_{0.5})O_3]$–$0.25(Bi_{0.5}Na_{0.5})_{0.7}Sr_{0.3}TiO_3$	800	8	90	[S106]
0.50 $NaNbO_3$-0.50 $NaTaO_3$	300	2.2	80.10%	[S107]
0.7 $NaNbO_3$-0.3 $CaTiO_3$	560	5.52	83.3	[S108]
$0.89NaNbO_3$-$0.11Bi_{0.5}K_{0.5}ZrO_3$	400	4.4	90	[S109]
$0.85BaTiO_3$–$0.15Bi(Mg_{2/3}Nb_{1/3})O_3$	143.5	1.13	95	[S110]
$0.95Ba_{0.85}Ca_{0.15}Zr_{0.1}Ti_{0.9}O_3$-$0.05(B_2O_3$-$Al_2O_3$-$SiO_2)$	200	1.153	/	[S111]
$0.9BaTiO_3$-$0.1(Bi_{0.9}Na_{0.1})(In_{0.8}Zr_{0.2})O_3$	180	1.33	88	[S112]
$0.88(Ba_{0.8}Sr_{0.2})TiO_3$-$0.12Bi(Zn_{2/3}Nb_{1/3})O_3$	225	1.62	99	[S113]
$0.9BaTiO_3$-$0.1Bi(Mg_{2/3}Nb_{1/3})O_3$	205	1.7	88	[S114]
$0.92(0.65BaTiO_3$-$0.35Bi_{0.5}Na_{0.5}TiO_3)$-$0.08Na_{0.73}Bi_{0.09}NbO_3$	172	1.7	82	[S115]
$0.92(0.92BaTiO_3$–$0.08K_{0.5}Bi_{0.5}TiO_3)$–$0.08NaNbO_3$	220	1.96	67	[S116]
$0.88BaTiO_3$–$0.12Bi(Li_{0.5}Nb_{0.5})O_3$	270	2.03	88	[S117]
$0.9BaTiO_3$–$0.1Bi(Li_{0.5}Ta_{0.5})O_3$	280	2.2	88	[S118]

$0.9BaTiO_3–0.1Bi(Zn_{0.5}Zr_{0.5})O_3$	264	2.46	/	[S119]
$BaTiO_3$-$0.06Bi_{2/3}(Mg_{1/3}Nb_{2/3})O_3$	520	4.55	91	[S120]
$0.6BaTiO_3$-$0.4Bi(Mg_{1/2}Ti_{1/2})O_3$	340	4.49	93	[S121]
$0.9BaTiO_3$-$0.1(Sr_{0.7}Bi_{0.2})TiO_3$	410	3.5	77	[S122]
$0.9Ba_{0.65}Sr_{0.35}TiO_3–0.1Bi(Mg_{2/3}Nb_{1/3})O_3$	400	3.34	85.7	[S123]
$0.85(0.8BaTiO_3$-$0.2Bi_{0.5}Na_{0.5}TiO_3)$-$0.15CaZrO_3$	540	9.04	87.2	[S124]
$0.95(0.65BiFeO_3$-$0.35BaTiO_3)$-$0.05Nb_2O_5$	90	0.71	/	[S125]
$0.75(Bi_{0.9}Nd_{0.1})FeO_3$-$0.25BaTiO_3$	170	1.82	41	[S126]
$0.57BiFeO_3–0.3BaTiO_3–0.13Bi(Li_{0.5}Nb_{0.5})O_3$	280	3.64	74	[S127]
$0.61BiFeO_3$-$0.33(Ba_{0.8}Sr_{0.2})TiO_3$-$0.06La(Mg_{2/3}Nb_{1/3})O_3$+0.1 wt.% MnO_2+2 wt.% $BaCu(B_2O_5)$	230	3.38	59	[S128]
$0.25Bi_{0.83}Sm_{0.17}Fe_{0.95}Sc_{0.05}O_3$-$0.75(0.85BaTiO_3$-$0.15Bi(Mg_{0.5}Zr_{0.5})O_3)$	206	3.2	92	[S129]
$0.6BiFeO_3–0.34BaTiO_3–006Ba(Zn_{1/3}Ta_{2/3})O_3$	160	2.56	71	[S130]
$0.62BiFeO_3–0.3BaTiO_3–0.08Nd$	240	2.45	54	[S131]
$0.35BiFeO_3$-$0.65SrTiO_3$	626	7.5	90	[S132]
$0.46Bi_{1.02}FeO_3$-$0.29BaTiO_3$-$0.25Bi_{0.5}Na_{0.5}TiO3$-$1\%Nb_2O_5$	250	3.9	80	[S133]
$0.7(Bi_{0.95}Nd_{0.05})[SFe_{0.95}(Li_{0.5}Nb_{0.5})_{0.05}]O_3$-$0.3BaTiO_3$+0.1 wt% MnO_2	290	3.2	73.7	[S134]
95 wt%$Ba_{0.4}Sr_{0.6}TiO_3–5$ wt%MgO	300	1.5	88.5	[S135]
$(Ba,Sr)_2TiSi_2O_8$	400	1.6	90.9	[S136]
$0.6SrTiO_3$-$0.4(Na_{0.5}Bi_{0.5})TiO_3$	210	1.7	70	[S137]
$0.45SrTiO_3$-$0.2Na_{0.5}Bi_{0.5}TiO_3$-$0.35BaTiO_3$	170	1.78	77	[S138]
$0.99SrTiO_3$-$0.01MgO$	362	1.86	89.3	[S139]
$Ba_{0.4}Sr_{0.6}(Ti_{0.996}Mn_{0.004})O_3$–2 wt% MgO	300	2.01	88.6	[S140]
$Sr_{0.985}Ce_{0.01}TiO_3$ @3 wt% SiO_2	290	2.23	/	[S141]
$SrTi_{0.985}(Zn_{1/3}Nb_{2/3})_{0.015}O_3$–4.5 wt%$ZnNb_2O_6$	422	2.35	77	[S142]
$0.6SrTiO_3$-$0.4(Bi_{0.48}La_{0.02}Na_{0.48}Li_{0.02}Ti_{0.98}Zr_{0.02}O_3)$	323	2.59	85	[S143]
$[S0.6SrTiO_3$-$0.4Na_{0.5}Bi_{0.5}TiO_3]$-0.5 mol%$ZrO_2$	285	2.84	71	[S144]
$0.9(Sr_{0.7}Bi_{0.2})TiO_3–0.1Bi(Mg_{0.5}Hf_{0.5})O_3$	360	3.1	93	[S145]
$Ba_{0.3}Sr_{0.7}TiO_3$-1.6 wt.%SiO_2	400	3.9	/	[S146]
$Ba_{0.4}Sr_{0.6}TiO_3$-$3Al_2O_3$-SiO_2	493	5.09	/	[S147]
$(K_{0.48}Na_{0.52})_{0.88}$ Bi $_{0.04}$ NbO_3	189	1.04	/	[S148]
$0.93K_{0.5}Na_{0.5}NbO_3–0.07Bi_{0.6}(Mg_{1/3}Nb_{2/3})O_3$	150	1.3	58.8	[S149]
$0.9K_{0.5}Na_{0.5}NbO_3$-$0.1BiFeO_3$	206	2	61	[S150]
$0.8(K_{0.5}Na_{0.5})NbO_3–0.2Sr(Sc_{0.5}Nb_{0.5})O_3$	400	2.6	73.2	[S151]

$K_{0.14}Bi_{0.12}Na_{0.5}NbO_3$-1 mol%CuO	300	2.89	80	[S152]
$0.85K_{0.5}Na_{0.5}NbO_3$-$0.15Bi(Zn_{0.5}Zr_{0.5})O_3$	325	3.5	86.8	[S153]
$0.9(K_{0.5}Na_{0.5})NbO_3$–$0.1Bi(Mg_{2/3}Nb_{1/3})O_3$–1.0 mol% CuO	400	4.02	57.3	[S154]
$0.85(K_{0.5}Na_{0.5})NbO_3$–$0.15SrTiO_3$	400	4.03	52	[S155]
$0.9(K_{0.5}Na_{0.5})NbO_3$–$0.1Bi(Mg_{2/3}Nb_{1/3})O_3$	300	4.08	62.7	[S156]
$0.825(K_{0.5}Na_{0.5})NbO_3$-$0.175Sr(Sc_{0.5}Nb_{0.5})O_3$	395	4.42	60	[S157]
$Ag_{0.76}La_{0.08}NbO_3$	476	7.01	77	[S158]
$Ag_{0.97}Nd_{0.01}Ta_{0.20}Nb_{0.80}O_3$	370	6.5	71	[S159]
$0.45AgNbO_3$-$0.55AgTaO_3$	460	6.3	90	[S160]
$Sm_{0.03}Ag_{0.91}NbO_3$	290	5.2	69.2	[S161]
$(Sm_{0.02}Ag_{0.94})(Nb_{0.9}Ta_{0.1})O_3$	280	4.87	63.5	[S162]
$Ag_{0.91}Sm_{0.03}NbO_3$	310	4.5	63	[S163]
$(Ag_{0.90}Ca_{0.05})(Nb_{0.95}Ta_{0.05})O_3$	210	3.36	58	[S164]
$Ag_{0.97}La_{0.01}NbO_3$-0.3 wt % MnO	142	3.2	62	[S165]
$Ag_{0.9}Sr_{0.05}NbO_3$	190	2.9	56	[S166]
$0.94(Na_{0.50}Bi_{0.50})TiO_3 - 0.06KSbO_3$	150	2.5	57	[S167]
$AgNbO_3$	175	2.1	50	[S168]
$Ag_{0.94}Bi_{0.02}Nb_{0.988}Sc_{0.02}O_3$	215	3.65	84.31	[S169]
0.1 wt % MnO_2-$AgNbO_3$-SiO_2	300	5.9	71	[S170]
$0.5Bi_{0.5}Na_{0.4}K_{0.1}TiO_3$-$0.5(2/3SrTiO_3$-$1/3Bi(Mg_{2/3}Ni_{1/3})O_3)$	7.19	94	460	This work

Table S5 Temperature-dependent energy storage properties of this work compared with other BNT-based bulk ceramics

No.	Ceramic compositions	Refs.
1	$0.78(Bi_{0.5}Na_{0.5})TiO_3$-$0.22NaNbO_3$	[S86]
2	$0.8Bi_{0.5}Na_{0.5}TiO_3$-$0.2SrNb_{0.5}Al_{0.5}O_3$	[S78]
3	$0.75Bi_{0.58}Na_{0.42}TiO_3$-$0.25SrTiO_3$	[S79]
4	$0.75Bi_{0.4465}Na_{0.4465}Ba_{0.057}La_{0.05}TiO_3$-$0.25Sr_{0.85}Bi_{0.1}TiO_3$	[S92]
5	$0.90(Na_{0.5}Bi_{0.5})_{0.7}Sr_{0.3}TiO_3$-$0.10Bi(Ni_{0.5}Sn_{0.5})O_3$	[S54]
6	$0.94Bi_{0.50}(Na_{0.78}K_{0.22})_{0.50}Ti_{0.96}(Al_{0.50}Nb_{0.50})_{0.04}O_3$-$0.06BaZrO_3$	[S171]
7	$0.5Bi_{0.5}Na_{0.4}K_{0.1}TiO_3$-$0.5(2/3SrTiO_3$-$1/3Bi(Mg_{2/3}Ni_{1/3})O_3)$	This work

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