Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.
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Supporting Information

A synergistic approach to attain high piezoelectricity in $Pb(Ni, Nb)O_3$-$Pb(Lu, Nb)O_3$-$PbTiO_3$ system

Mengdi Cheng[a], Yangxi Yan[a], Zhimin Li[a], Pangpang Wang[b], Ri-ichi Murakami[c] and Dongyan Zhang[a,*]

[a] *School of Advanced Materials and Nanotechnology, Xidian University, 266 Xinglong Section of Xifeng Road, Xi'an 710126, P.R. China*

[b] *Nanomaterials Group, Institute of System, Information Technologies and Nanotechnologies (ISIT), Fukuoka Industry-Academia Symphonicity (FiaS), 4-1 Kyudaishinmachi, Nishi-ku, Fukuoka 819-0388, Japan*

[c] *School of Mechanical Engineering, Chengdu University, No. 2025, Chengluo Avenue, Chengdu 610106, P. R. China*

Corresponding author. E-mail addresses: zhangdongyan@xidian.edu.cn

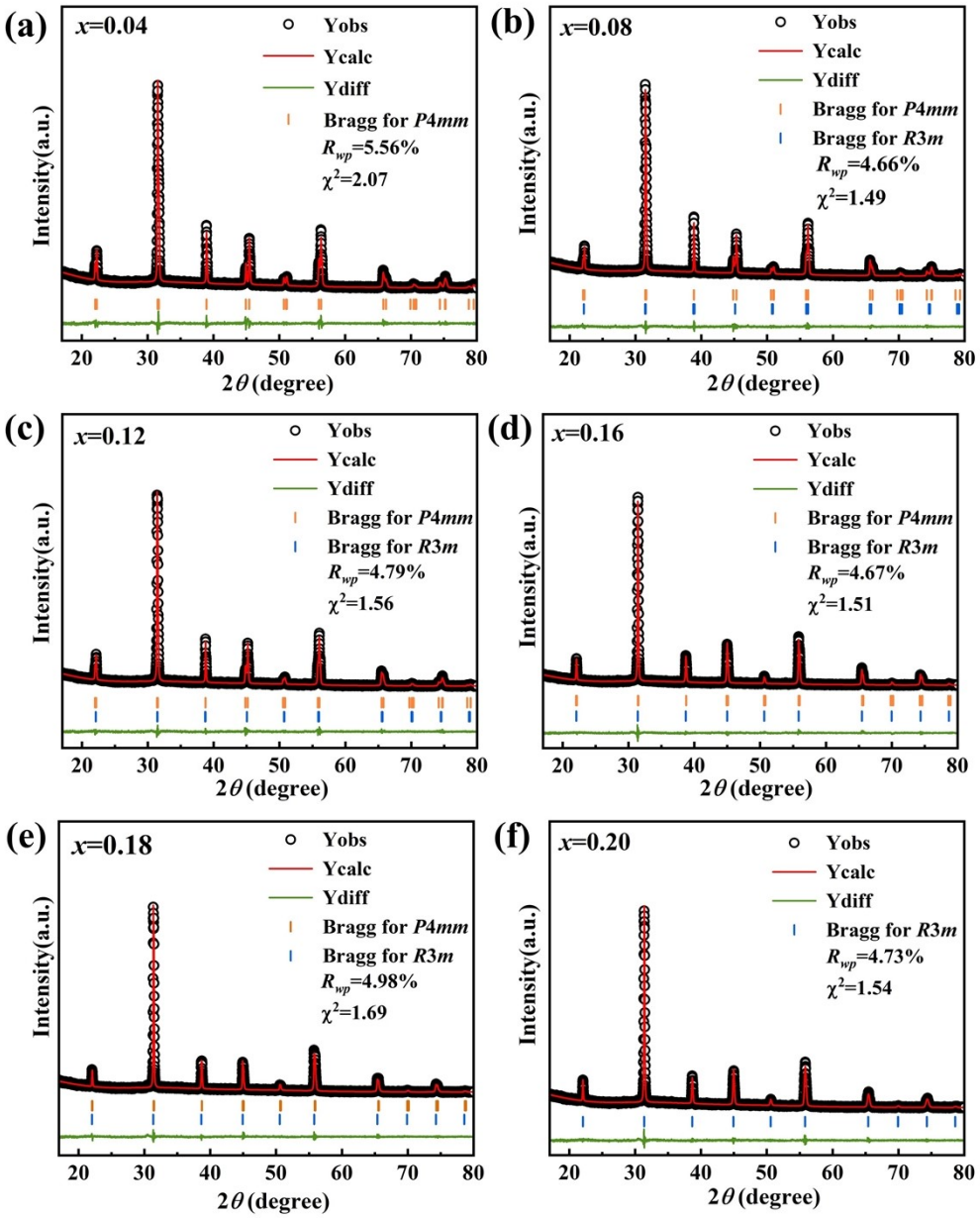

Fig. S1. Rietveld refinements results of XRD patterns for PNN-*x*PLN-PT ceramics with *R*3*m* and *P*4*mm* models, (a) $x = 0.04$, (b) $x = 0.08$, (c) $x = 0.12$, (d) $x = 0.16$, (e) $x = 0.18$ and (f) $x = 0.20$.

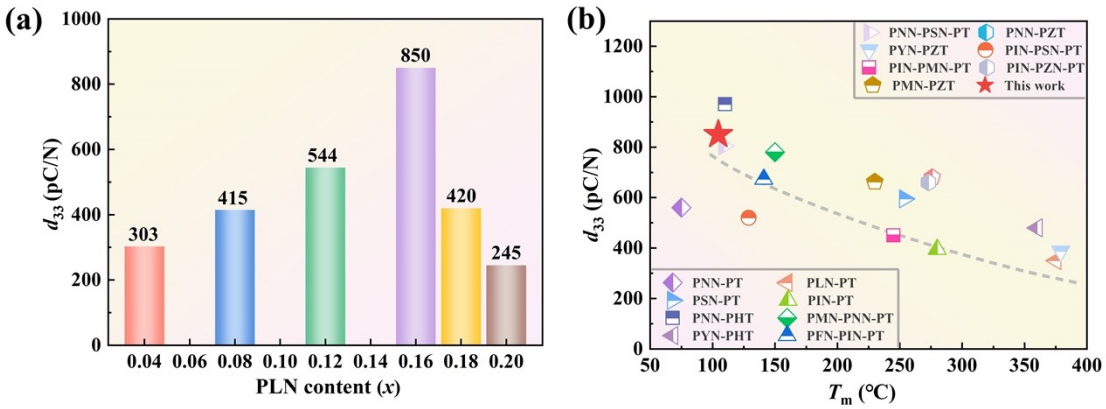

Fig. S2. (a) d_{33} values of PNN-*x*LN-PT ceramics. (b) Comparison of d_{33} versus T_m for various lead-based polynary piezoelectric ceramics with data collected from the reported literature.[1-15]

Table S1 Rietveld refinements parameters of PNN-*x*PLN-PT ceramics.

Composition	Structure	Fraction (%)	Lattice parameters	Agreement factors	
				R_{wp}%	χ^2
x=0.04	*P*4*mm*	100	*a*=3.9844(Å) *c*=4.0279 (Å)	5.56	2.07
	*R*3*m*	0	/		
x=0.08	*P*4*mm*	81.8	*a*=4.00183(Å) *c*=4.0417 (Å)	4.66	1.49
	*R*3*m*	18.2	*a*=4.0362 (Å) *α*=89.947 °		
x=0.12	*P*4*mm*	69.5	*a*=4.0125 (Å) *c*=4.0433 (Å)	4.79	1.56
	*R*3*m*	30.5	*a*=4.0233 (Å) *α*=89.924 °		
x=0.16	*P*4*mm*	55.1	*a*=4.0205(Å) *c*=4.0392 (Å)	4.67	1.51
	*R*3*m*	44.9	*a*=4.0279 (Å) *α*=89.931 °		
x=0.18	*P*4*mm*	36.5	*a*=4.0218 (Å) *c*=4.0330 (Å)	4.98	1.69
	*R*3*m*	63.5	*a*=4.0258 (Å) *α*=89.943 °		
x=0.20	*P*4*mm*	0	/	4.73	1.54
	*R*3*m*	100	*a*=4.0304 (Å) *α*=89.938 °		

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