

Correlation between piezoelectric and magnetic properties of Fe and Sm co-substituted potassium niobate piezoelectric ceramics

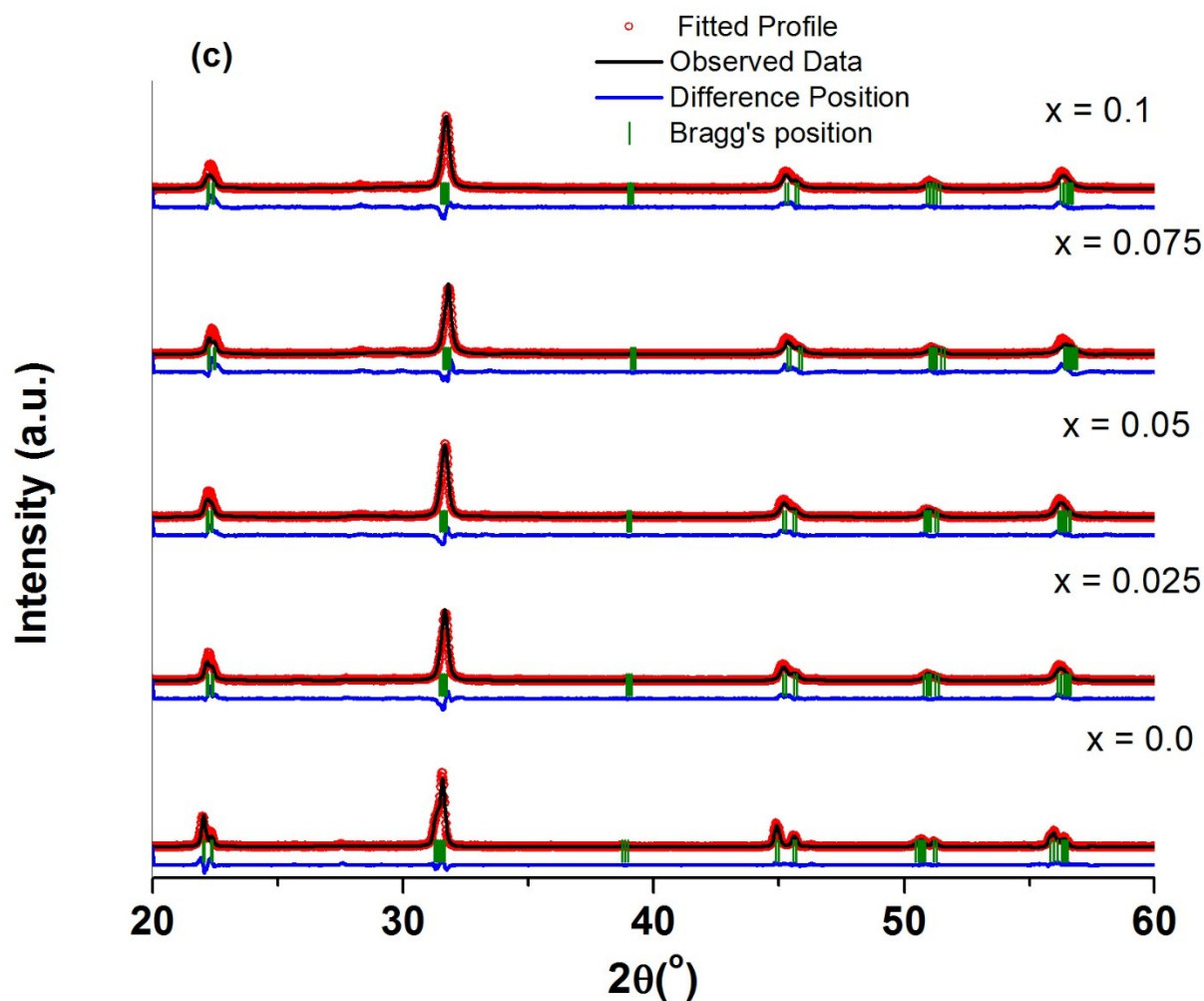


Fig. S1 Rietveld refinement of the studied samples at room temperature using Amm2 symmetry.

Table S1 showing the Rietveld refined parameters for the studied samples

	R_p	R_{wp}	R_e	Bragg R Factor	Rf factor
$x = 0.0$	16.1	20.4	5.2	2.51	3.49
$x = 0.025$	15.4	17.2	6.09	3.51	3.59
$x = 0.05$	15.9	16.8	6.52	2.70	3.11
$x = 0.075$	22.0	22.4	7.00	3.17	5.25
$x = 0.1$	21.6	24.1	7.95	3.32	4.04

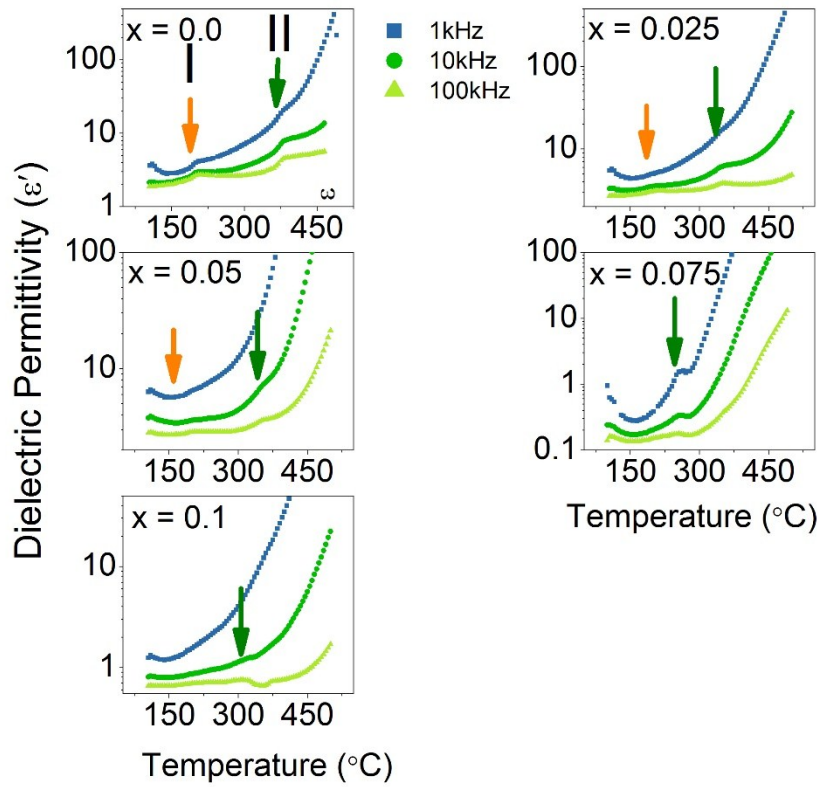


Fig. S2 ϵ' -T plots plotted at different frequencies and it is found that there are two kinks marked as I with orange and II with green arrows up to $x = 0.05$. Whereas, in $x = 0.075$ and $x = 0.1$ samples, a shoulder is observed at a temperature lower than the temperatures observed up to $x = 0.05$.

Table S2: Lattice parameters and atomic positions for the high temperature XRD data for x = 0.05 sample (calcined sample)

Temp	Symmetry	a(Å)	b(Å)	c(Å)	Element name	x	y	z
240°C	Amm2	4.0277	5.7258	5.7582	K/Sm	0	0	0.50158
					Nb/Fe	0.5	0	0.95301
					O1	0	0	0.95948
					O2	0.5	0.29912	0.61389
325°C	P4mm	4.0127	4.0127	4.0397	K/Sm	0.5	0.5	0.53658
					Nb/Fe	0	0	0.04117
					O1	0.5	0	0.02526
					O2	0	0	0.65447
370°C	Pm $\bar{3}$ m	4.05502	4.05502	4.05502	K/Sm	0	0	0
					Nb/Fe	0.5	0.5	0.5
					O1	0	0.5	0.5
					O2	0.5	0	0.5