No. 1C-b34 $PbTiO_3$–$Pb(Sc_{1/2}Nb_{1/2})O_3$

1b	Ferroelectric transition temperature: Fig. 1C-b34-001.	
2a	Single crystal growth using $PbO–B_2O_3$ flux: see	96Yam
	Hot isostatic pressing of ceramics: see	95Ada
3a	Lattice parameters: Fig. 1C-b34-002.	
5a	Dielectric constant: Fig. 1C-b34-003.	
c	Spontaneous polarization: Fig. 1C-b34-004.	
7a	Piezoelectricity: Table 1C-b34-001; Fig. 1C-b34-005.	

Table 1C-b34-001. $Pb[(Sc_{1/2}Nb_{1/2})_{0.575}Ti_{0.425}]O_3$ (ceramics). Dielectric and electromechanical properties [93Yam].

Additive	Non	1.0% Nb_2O_5	2.0% Sc_2O_3
Firing temperature T [°C]	1275	1275	1275
Density ρ [$\cdot 10^3$ kgm^{-3}]	7.72	7.72	7.61
Fired grain size [μm]	15.0	5.2	9.6
Resistivity ρ at 125°C [Ω cm]	$4\cdot10^7$	$8\cdot10^9$	$4\cdot10^7$
Dielectric constant κ			
before poling	2010	1930	1940
after poling	1550	2540	1480
maximum at Θ_f	28400	39100	24000
Dielectric loss tan δ			
before poling	0.012	0.022	0.012
after poling	0.007	0.016	0.008
Coupling factor			
k_p	0.667	0.694	0.629
k_t	0.547	0.522	0.526
k_{33}	0.740	0.760	0.725
Piezoelectric constant			
d_{33} [$\cdot 10^{-12}$ CN^{-1}]	389	504	359
g_{33} [$\cdot 10^{-3}$ VmN^{-1}]	28.4	22.3	27.5
Frequency constant			
N_p [Hz m]	2080	2022	2152
N_t [Hz m]	1994	1987	2032
Mech. quality factor Q_{mech}	120	80	300
Curie temperature Θ_f [°C]	260	248	260
E_e [$\cdot 10^5$ Vm^{-1}]	5	7	5
P_r [Cm^{-2}]	0.19	0.28	0.13
Poisson's ratio	0.15	0.25	0.19

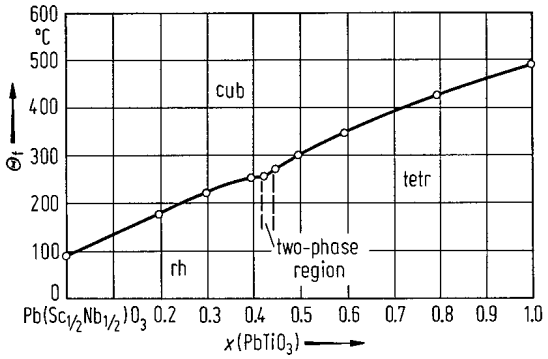

Fig. 1C-b34-001. (1–x)Pb($Sc_{1/2}Nb_{1/2}$)O_3·x $PbTiO_3$. Θ_f vs. x [68Ten].

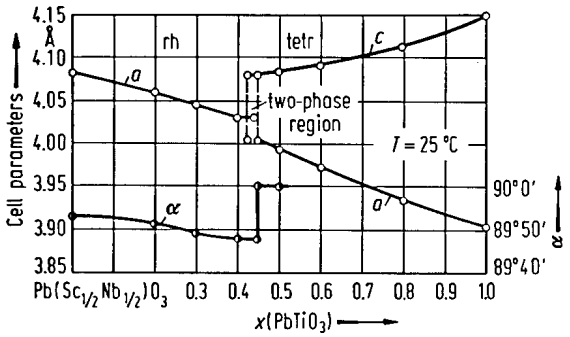

Fig. 1C-b34-002. (1–x)Pb($Sc_{1/2}Nb_{1/2}$)O_3·x $PbTiO_3$. *a*, *c*, α vs. x [68Ten]. α: rhombohedral angle.

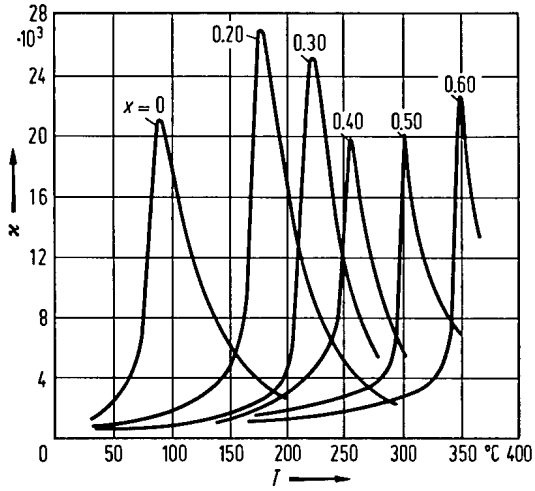

Fig. 1C-b34-003. (1–x)Pb($Sc_{1/2}Nb_{1/2}$)O_3·x $PbTiO_3$ (ceramics). κ vs. T [68Ten]. Parameter: x. f = 1 kHz.

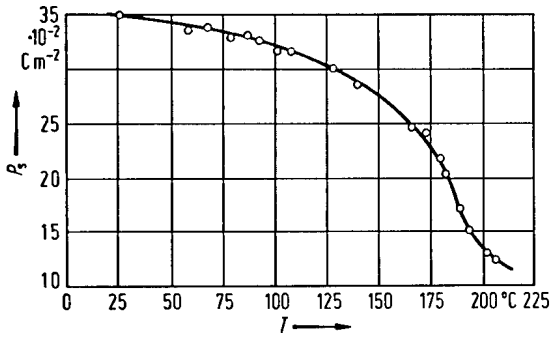

Fig. 1C-b34-004. 0.8 $Pb(Sc_{1/2}Nb_{1/2})O_3$·0.2 $PbTiO_3$ (ceramics). P_s vs. T [68Ten].

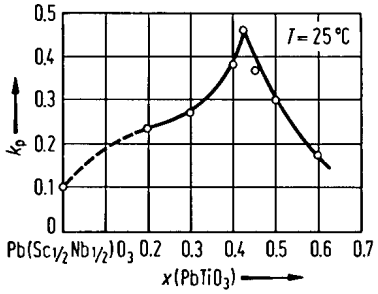

Fig. 1C-b34-005. (1–x)Pb($Sc_{1/2}Nb_{1/2}$)O_3·x $PbTiO_3$ (ceramics). k_p vs. x [68Ten].

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