No. 1B-a1 ($(Na_{1/2}Bi_{1/2})TiO_3$), Sodium bismuth titanate
(M = 211.86)

1a	Ferroelectricity in $(Na_{1/2}Bi_{1/2})TiO_3$ was found by Smolenskii and Agranovkaya in 1959.	59Smo

b

phase	III	II'	II	I
state	F		P	P
crystal system	rhombohedral		tetragonal	cubic
space group				$Pm3m-O_h^1$
Θ [°C]	200	320	540	

The nature and properties in the phase II' are not well understood.
In this phase, an antiferroelectric phase [a]), coexistence of the rhombohedral (ferroelectric) and tetragonal phases [b]) [c]) and an antiferroelectric and/or incommensurate structure phase [d]) were discussed.

[a]) 62Iva
[b]) 85Vak
[c]) 88Shu
[d]) 94TuC

3	Crystal structure: disordered perovskite. a = 3.891(2) Å, α = 89°36'(3) at RT.	62Iva
4	Lattice distortion: Fig. 1B-a1-001.	
5a	Dielectric constant: Figs. 1B-a1-002...1B-a1-005. Time evaluation of κ: see	90Suc
c, d	Remanent polarization and pyroelectric coefficient: Fig. 1B-a1-006.	
9a	Birefringence: Fig. 1B-a1-007. Optical transmission: Fig. 1B-a1-008. Infrared spectrum: see	73Kal
10a	Raman scattering: see	86Zha
14b	Neutron diffraction and scattering: Figs. 1B-a1-009...1B-a1-011. Neutron diffuse scattering and X-ray diffraction studies around 220 °C: see	85Vak
15a	Striped and herringbone domains were observed by polarized light: see	94Par

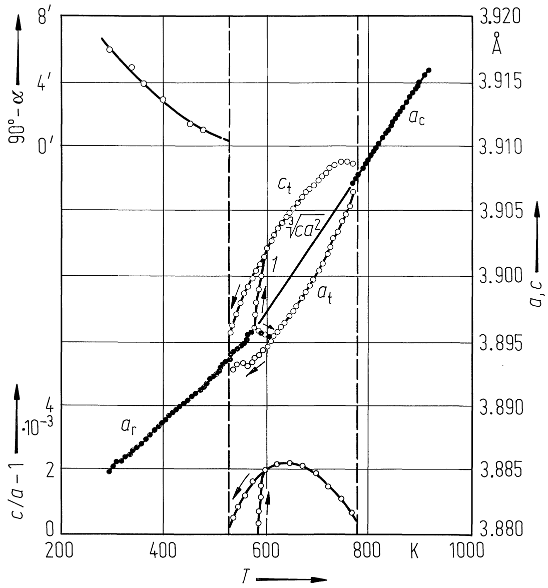

Fig. 1B-a1-001. $(Na_{1/2}Bi_{1/2})TiO_3$. Lattice parameter vs. *T* [82Zvi]. a_r, α for rhombohedral, a_t, c_t for tetragonal and a_c for cubic phases. The line *1* shows the temperature hysteresis in the tetragonal phase.

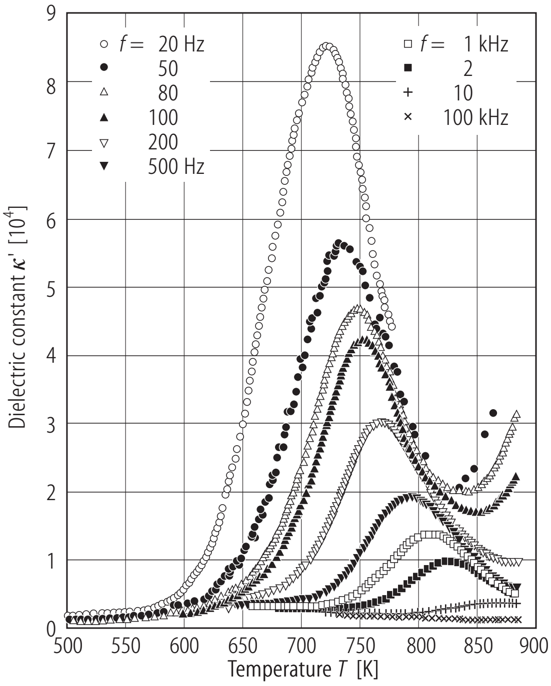

Fig. 1B-a1-002. $(Na_{1/2}Bi_{1/2})TiO_3$. κ' vs. T [94TuC]. Parameter: *f*. Heating run.

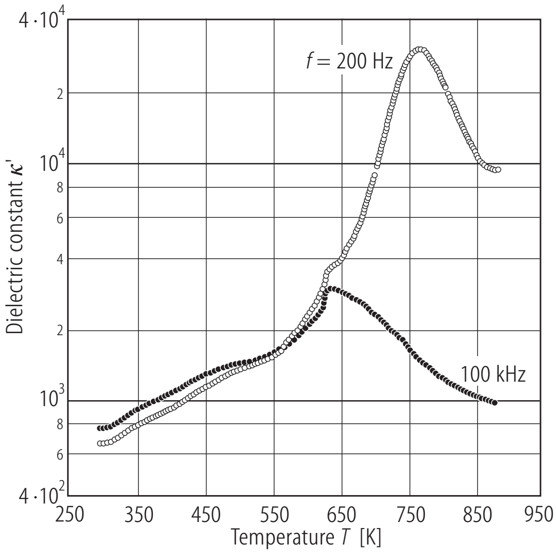

Fig. 1B-a1-003. $(Na_{1/2}Bi_{1/2})TiO_3$. κ' vs. T [94TuC]. Parameter: f. Heating run.

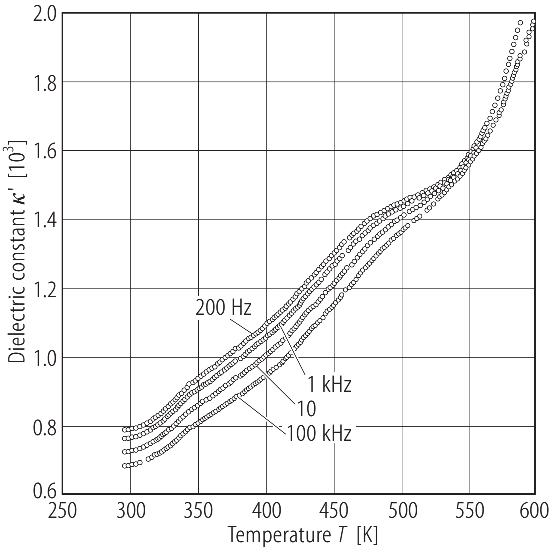

Fig. 1B-a1-004. $(Na_{1/2}Bi_{1/2})TiO_3$. κ' vs. T in the vicinity of Θ_f [94TuC]. Parameter: f.

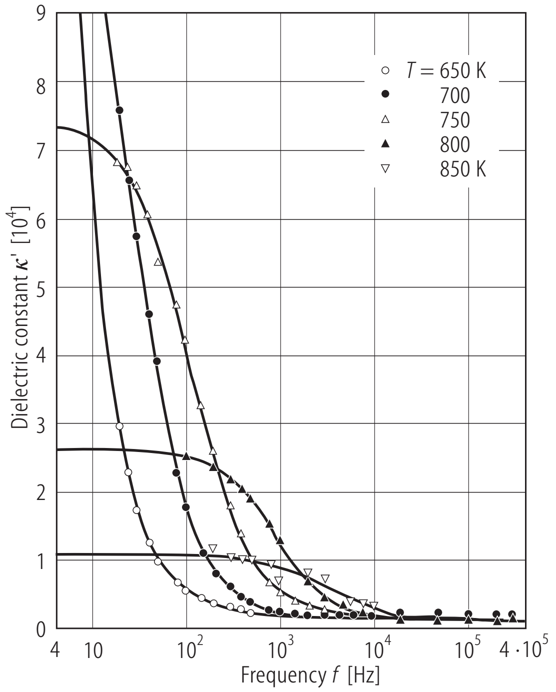

Fig. 1B-a1-005. $(Na_{1/2}Bi_{1/2})TiO_3$. κ' vs. f [94TuC]. Parameter: T. The solid curves are fits of the Cole-Cole equation, $\kappa - \kappa_\infty = (\kappa_0 - \kappa) / [1 + (\mathrm{i}f/f_0)^{1-\alpha}]$, with $\kappa_\infty = 1280$ and parameters in the following table.

T [K]	650	700	750	800	850
f_0^{-1} [$\cdot 10^{-3}$s]	384.7	33.99	8.65	1.12	0.30
α	0.104	0.122	0.158	0.103	0.195
κ_0	576000	117300	74830	26290	10930

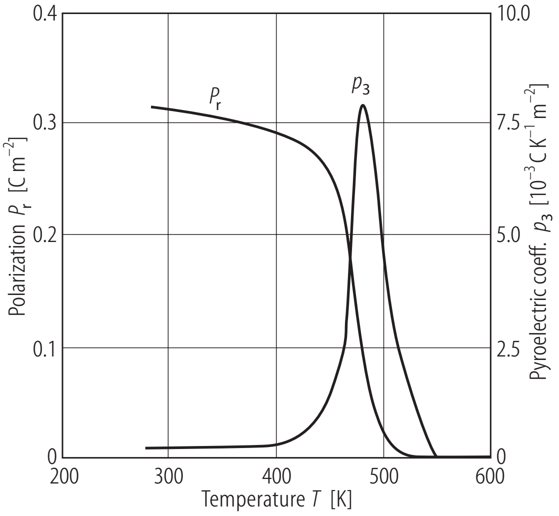

Fig. 1B-a1-006. $(Na_{1/2}Bi_{1/2})TiO_3$. P_r, p_3 vs. T [84Eme]. P_r: remanent polarization. p_3: pyroelectric coefficient along [001].

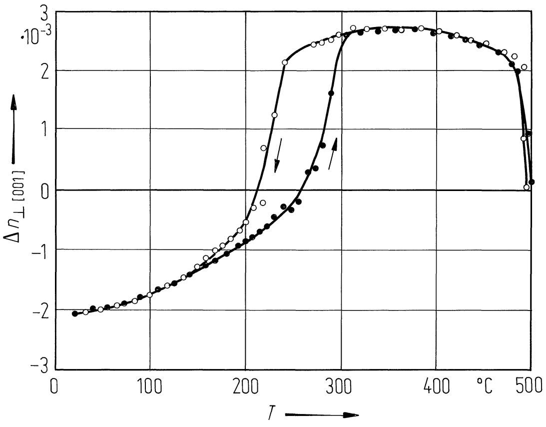

Fig. 1B-a1-007. $(Na_{1/2}Bi_{1/2})TiO_3$. $\Delta n_{\perp[001]}$ vs. T [81Kru]. λ = 632.8 nm.

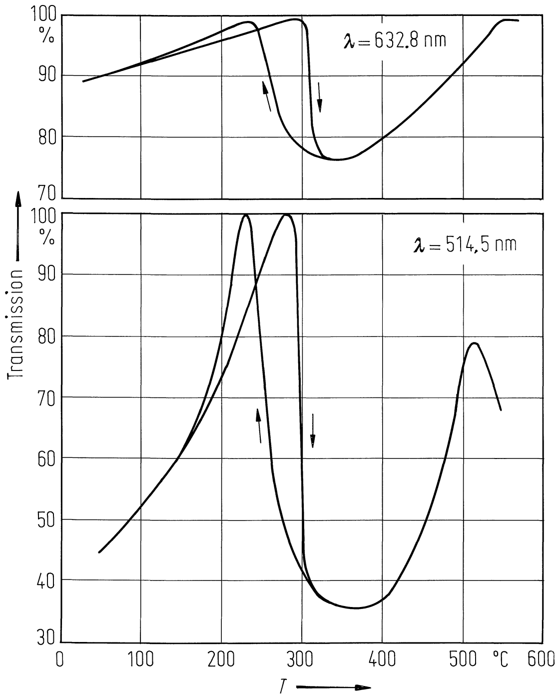

Fig. 1B-a1-008. $(Na_{1/2}Bi_{1/2})TiO_3$. Transmission vs. *T* [82Pro]. Sample thickness is 1 mm.

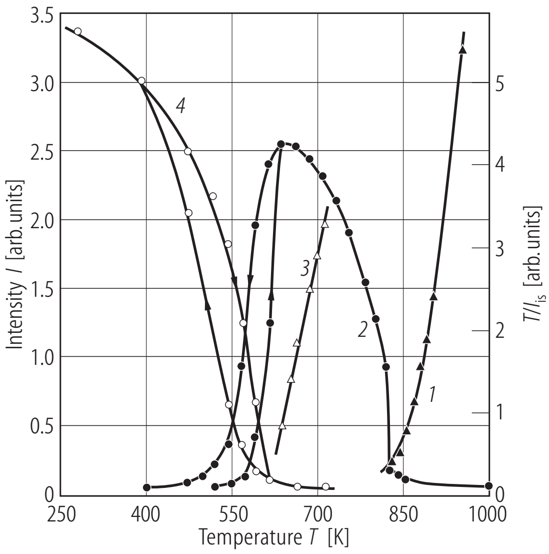

Fig. 1B-a1-009. $(Na_{1/2}Bi_{1/2})TiO_3$. *I* and T/I_{is} vs. *T* [89Vak]. *I* : neutron intensity of superlattice reflections. I_{is} = inelastic scattering intensity. Curve *2*: (3/2 1/2 0), *4*: (3/2 1/2 1/2), *1*: T/I_{is} at M point. *3*: T/I_{is} at R point.

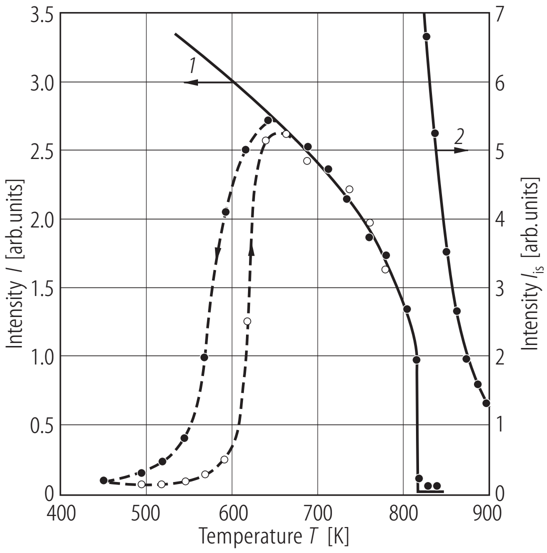

Fig. 1B-a1-010. $(Na_{1/2}Bi_{1/2})TiO_3$. *I* (3/2 1/2 0), I_{is} vs. *T* [89Vak]. *I* (3/2,1/2,0): neutron intensity of M superlattice structure. I_{is}: neutron inelastic scattering intensity at M point.

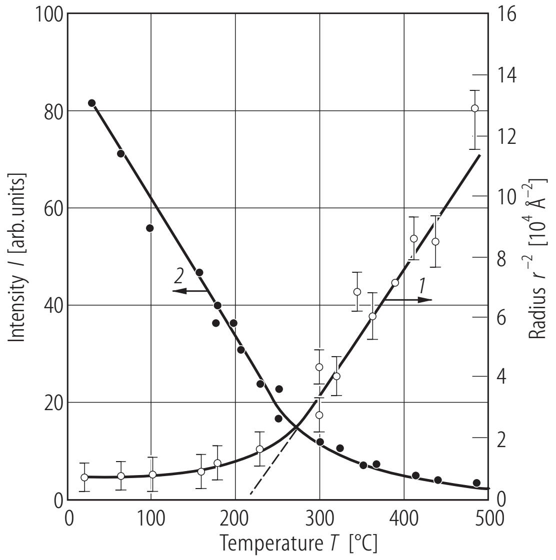

Fig. 1B-a1-011. $(Na_{1/2}Bi_{1/2})TiO_3$. *I*, r^{-2} vs. *T* [89Vak]. *I* : peak intensity of quasi-elastic scattering of neutrons. r^{-2}: square of reciprocal of correlation radius.

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