No. 1B-b17 $Pb(Co_{1/2}W_{1/2})O_3$
(M = 376.7)

1a	Antiferro- and ferroelectric properties in $Pb(Co_{1/2}W_{1/2})O_3$ was discovered by Filip'ev et al. in 1963.	63Fil
b	see table below *) Weakly ferromagnetic. The existence of an incommensurate phase in $Pb(Co_{1/2}W_{1/2})O_3$ down to 150 K was reported by Tamura.	85Bri; 78Tam

phase	IV	III	II	I
state	F, A_{magn} *)	F, P_{magn}	A, P_{magn}	P, P_{magn}
crystal system		orthorhombic	monoclinic	cubic
Θ [K]		235	298	

2a	Reaction of formation: DTA method. Crystal growth: flux method.	76Tok 65Bok
3a	Unit cell parameters: Phase I: a = 8.010(3) Å at 306 K. Phase II: a = 5.66994 Å, b = 5.69248 Å, c = 7.73338 Å at 260 K.	 85Bri 92Kim
b	Crystal structure: A superstructure was observed which was completely explained by alternation of the oxygen octahedra by Co^{2+} and W^{6+} cations along the three directions. The real elementary lattice is a cubic face-centered one with the parameter $a = 2a_0$ for phase I. Satellite reflections indicated that the monoclinic phase (II) is commensurate with a dependence on temperature, and showed an intensity reduction at ≈235 K, but existed down to about 150 K.	64Fil 85Bri
4	Lattice distortion: Fig. 1B-b17-001. Thermal expansion: Fig. 1B-b17-002.	
5a	Dielectric constant: Figs. 1B-b17-003...1B-b17-005. Phase diagram in regard to p: 1B-b17-006.	
c	Polarization: Fig. 1B-b17-007.	
9a	Birefringence: Fig. 1B-b17-008.	
12	Magnetic susceptibility and magnetization: Fig. 1B-b17-009, Fig. 1B-b17-010.	
14b	Neutron inelastic scattering: Fig. 1B-b17-011, Fig. 1B-b17-012.	

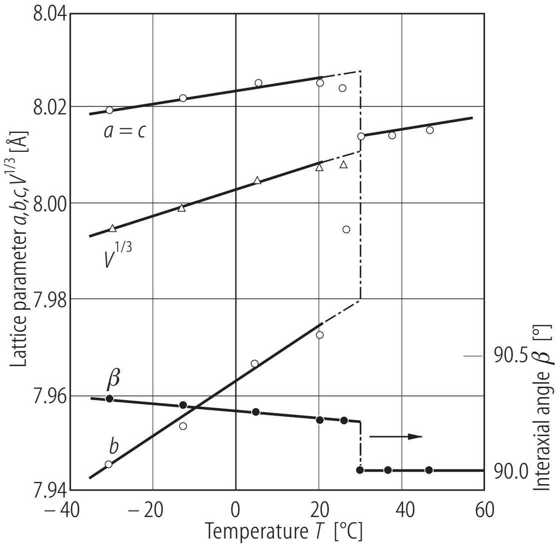

Fig. 1B-b17-001. $Pb(Co_{1/2}W_{1/2})O_3$ (ceramics). Unit cell parameters vs. *T* [92Kim]. *a*, *b*, *c*, *β*, $V^{1/3}$: unit cell parameters of monoclinic phase for *T* = 27 °C.

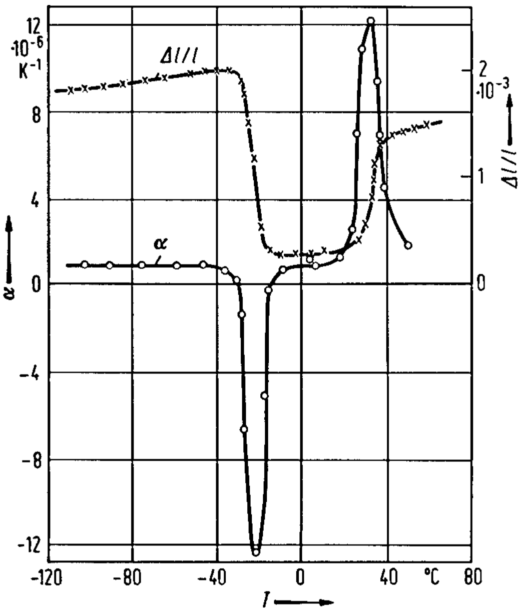

Fig. 1B-b17-002. $Pb(Co_{1/2}W_{1/2})O_3$ (ceramics). $\Delta l/l$, α vs. T [71Isu].

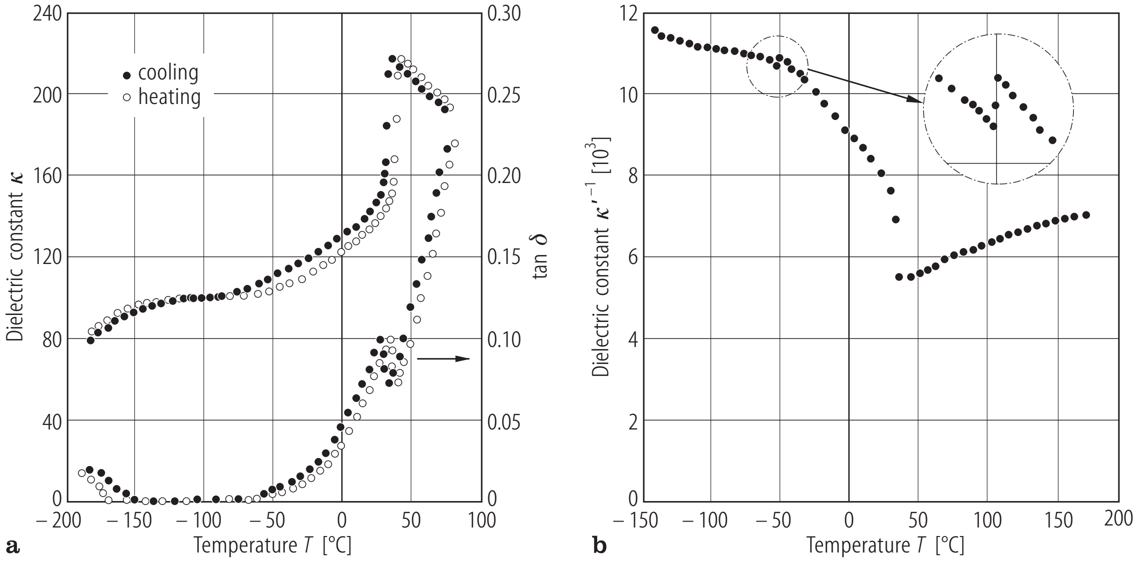

Fig. 1B-b17-003. $Pb(Co_{1/2}W_{1/2})O_3$ (ceramics). (**a**) κ, tan δ vs. T. (**b**) κ'^{-1} vs. T [92Kim].

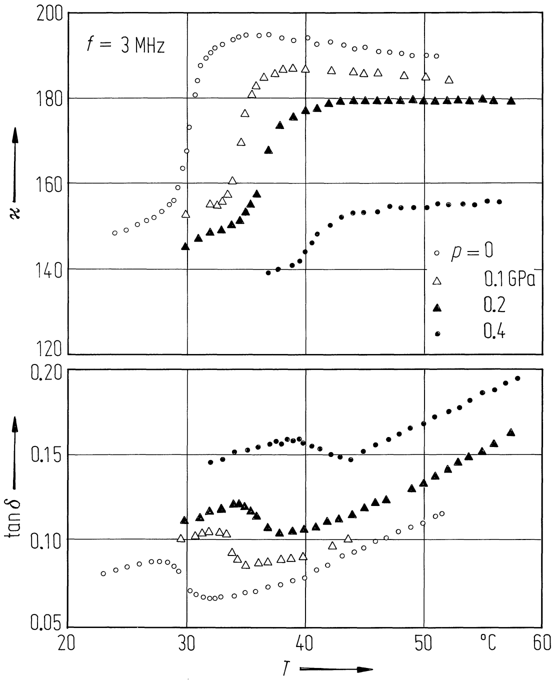

Fig. 1B-b17-004. $Pb(Co_{1/2}W_{1/2})O_3$ (ceramics). κ, $\tan\delta$ vs. *T* [85Hac]. Parameter: *p*.

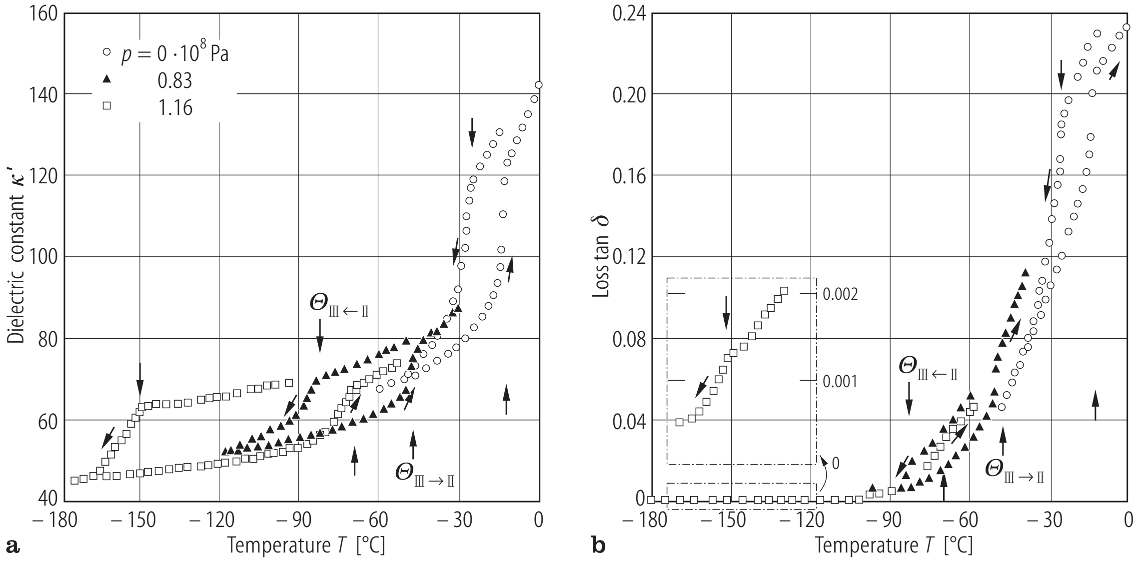

Fig. 1B-b17-005. $Pb(Co_{1/2}W_{1/2})O_3$ (ceramics). κ', $\tan\delta$ vs. T [87Hac]. Parameter: p.

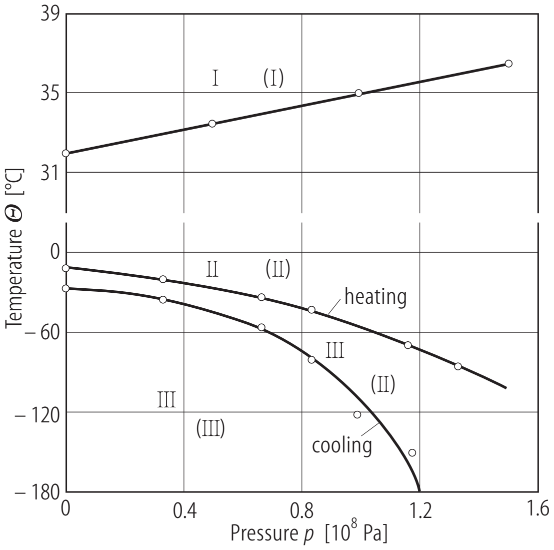

Fig. 1B-b17-006. $Pb(Co_{1/2}W_{1/2})O_3$ (ceramics). Θ vs. p [87Hac]. Phases I, II, III: on heating. Phases (I), (II), (III): on cooling.

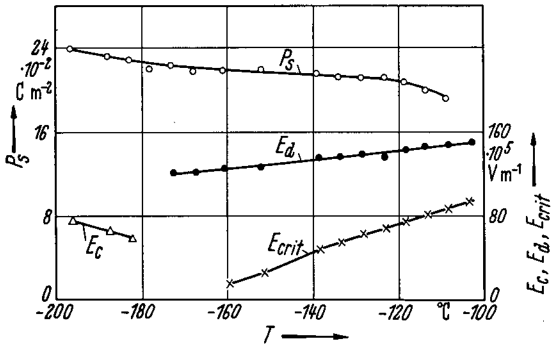

Fig. 1B-b17-007. $Pb(Co_{1/2}W_{1/2})O_3$. P_s, E_c, E_d, E_{crit} vs. T [64Bok]. E_d: field in which a loop appears. E_{crit}: field in which the loop disappears.

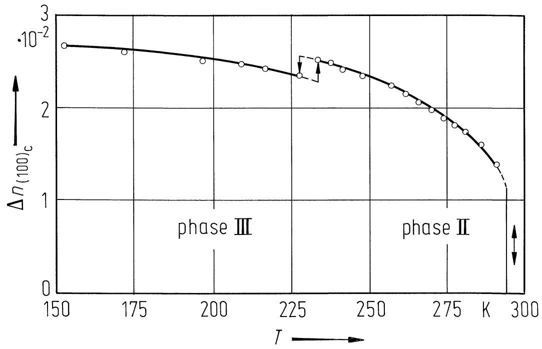

Fig. 1B-b17-008. $Pb(Co_{1/2}W_{1/2})O_3$. $\Delta n_{(100)c}$ vs. T [85Bri]. λ = 546 nm. $(100)_c$: 100-plane of cubic phase.

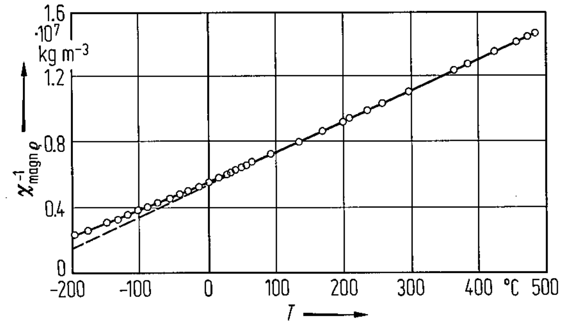

Fig. 1B-b17-009. $Pb(Co_{1/2}W_{1/2})O_3$. $\chi^{-1}_{magn\,\rho}$ vs. *T* [64Bok].

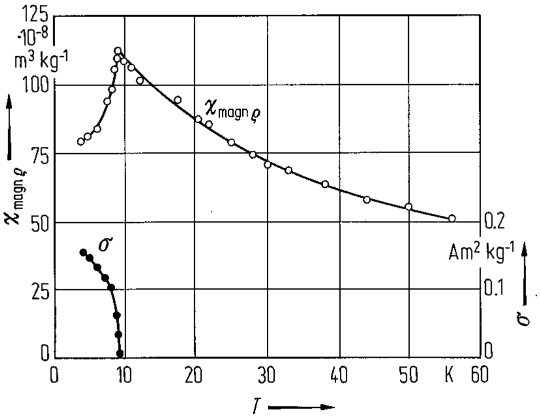

Fig. 1B-b17-010. $Pb(Co_{1/2}W_{1/2})O_3$ (ceramics). $\chi_{magn\,\rho}$, σ vs. T [66Kiz]. σ: specific magnetization.

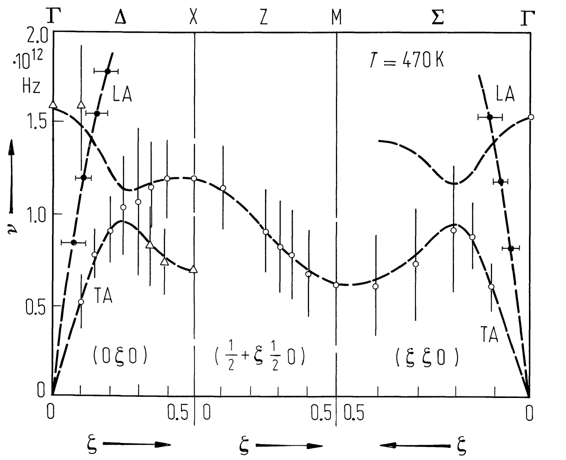

Fig. 1B-b17-011. $Pb(Co_{1/2}W_{1/2})O_3$ (ceramics). ν vs. ζ [85Büh]. ν: phonon frequency, ζ: wave vector coordinate. Vertical bars show line width. Triangles and open circles: TA modes.

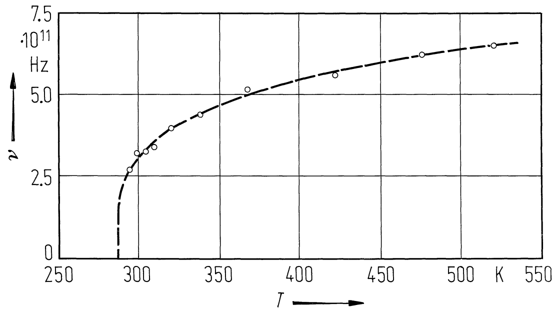

Fig. 1B-b17-012. $Pb(Co_{1/2}W_{1/2})O_3$. *ν* vs. *T* [85Büh]. *ν*: soft phonon frequency at M of Brillouin zone.

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