No. 2B-4 Li_2O-Nb_2O_5-MO_2 (M = Ti, Zr, Sn, Te)

1b	Phase relation: Table 2B-4-001; Figs. 2B-4-001...2B-4-003. Ferroelectric transition temperature: Table 2B-4-001; Fig. 2B-4-004, Fig. 2B-4-005.	87Elo
3a	Unit cell parameters: Figs. 2B-4-005...2B-4-007.	
9a	Refractive index: Fig. 2B-4-007, Fig. 2B-4-008. Refractive index profiles of high dose Ti implanted optical waveguides: see	90Bre
10a	Raman scattering of $LiNbO_3$:Ti channel waveguides: see	93Ram
14c	EXAFS of Ti and Ni doped crystals: see	91Zal
16	Guided wave modulators in Ti ion implanted waveguides: see $LiNbO_3$:Ti:Er. Waveguide amplifiers: see Synchrotron radiation topographic study of Ti-diffused and proton-exchanged crystals: see Ti site study in $LiNbO_3$: Ti by means of γ-γ perturbed angular correlated PIXE-channeling technique: see	89Ash 94Bri 93Har 94Hau

Table 2B-4-001. $Li_{1+p}Nb_{1+q}Zr_rO_3$, $Li_{1+p}Ta_{1+q}Zr_rO_3$. Solid solution limits and ferroelectric transition temperatures at solubility limits [84Elo].

Solid solutions	M = Nb, M' = Zr	M = Ta, M' = Zr	
	x_{max}	x_{max}	Θ_f [°C] at x_{max}
$Li_{1+x}M_{1-x/5}O_3$	0.05	0.07	640
$Li_{1+x}M_{1-x}M'_xO_3$	0.02	0.12	345
$Li_{1+x}M_{1-5x}M'_{6x}O_3$	0.01	0.02	375
$Li_{1-x}M_{1-3x}M'_{4x}O_3$	0.01	0.02	590
$Li_{1-x}M_{1-x}M'_{3x/2}O_3$	0.025	0.06	580
$Li_{1-x}M_{1-x/3}M'_{2x/3}O_3$	0.03	0.09	545
$Li_{1-x}M_{1+x/5}O_3$	0.085	0.12	485

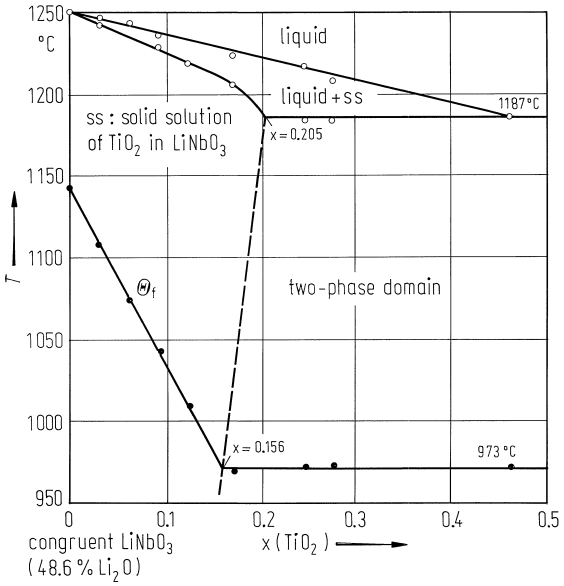

Fig. 2B-4-001. $LiNbO_3 \cdot x\ TiO_2$. Phase diagram [81Gue].

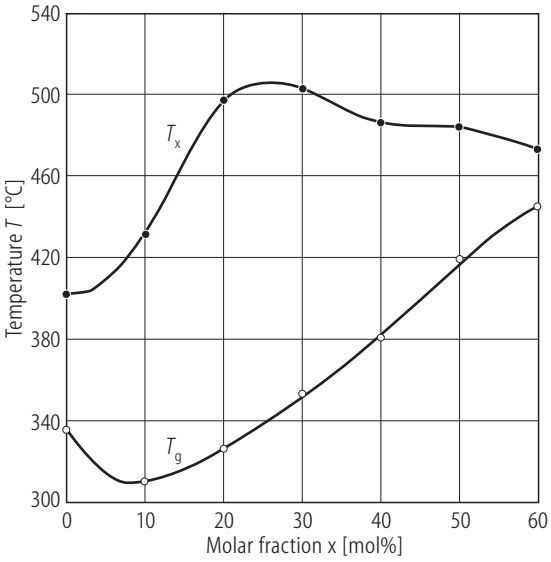

Fig. 2B-4-002. (1−x)TeO_2·x $LiNbO_3$ (amorphous). T_x, T_g vs. x [91Kom]. T_x: crystallization onset temperature; T_g: glass transition temperature.

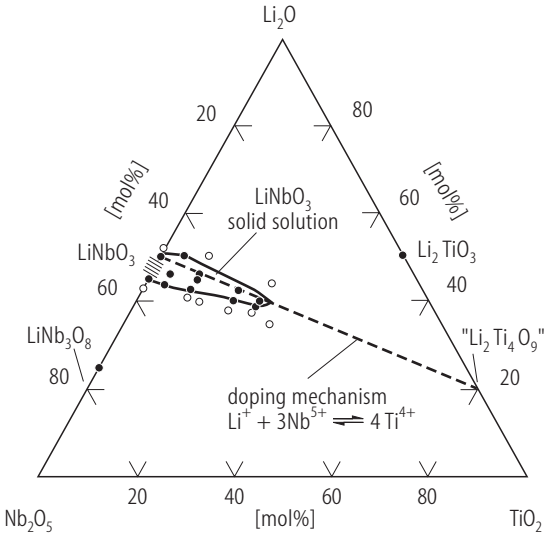

Fig. 2B-4-003. Li_2O–TiO_2–Nb_2O_5. Formation of $LiNbO_3$ solid solutions in the composition triangle Li_2O–TiO_2–Nb_2O_5 [87Vil].

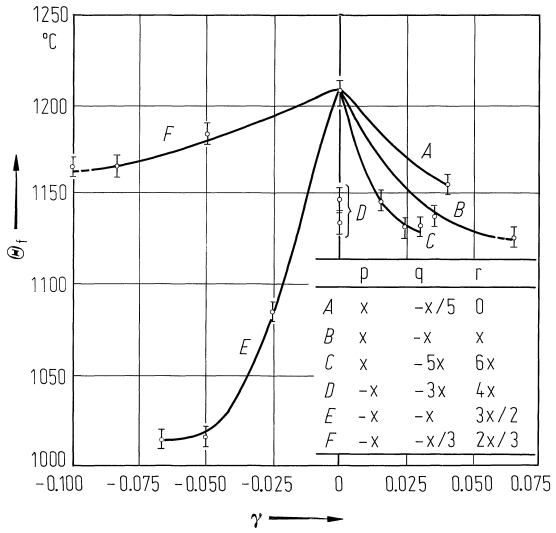

Fig. 2B-4-004. $Li_{1+p}Nb_{1+q}Ti_rO_3$. Θ_f vs. γ [86Elo]. γ: stoichiometry deviation given by p + q + r. Parameter: composition.

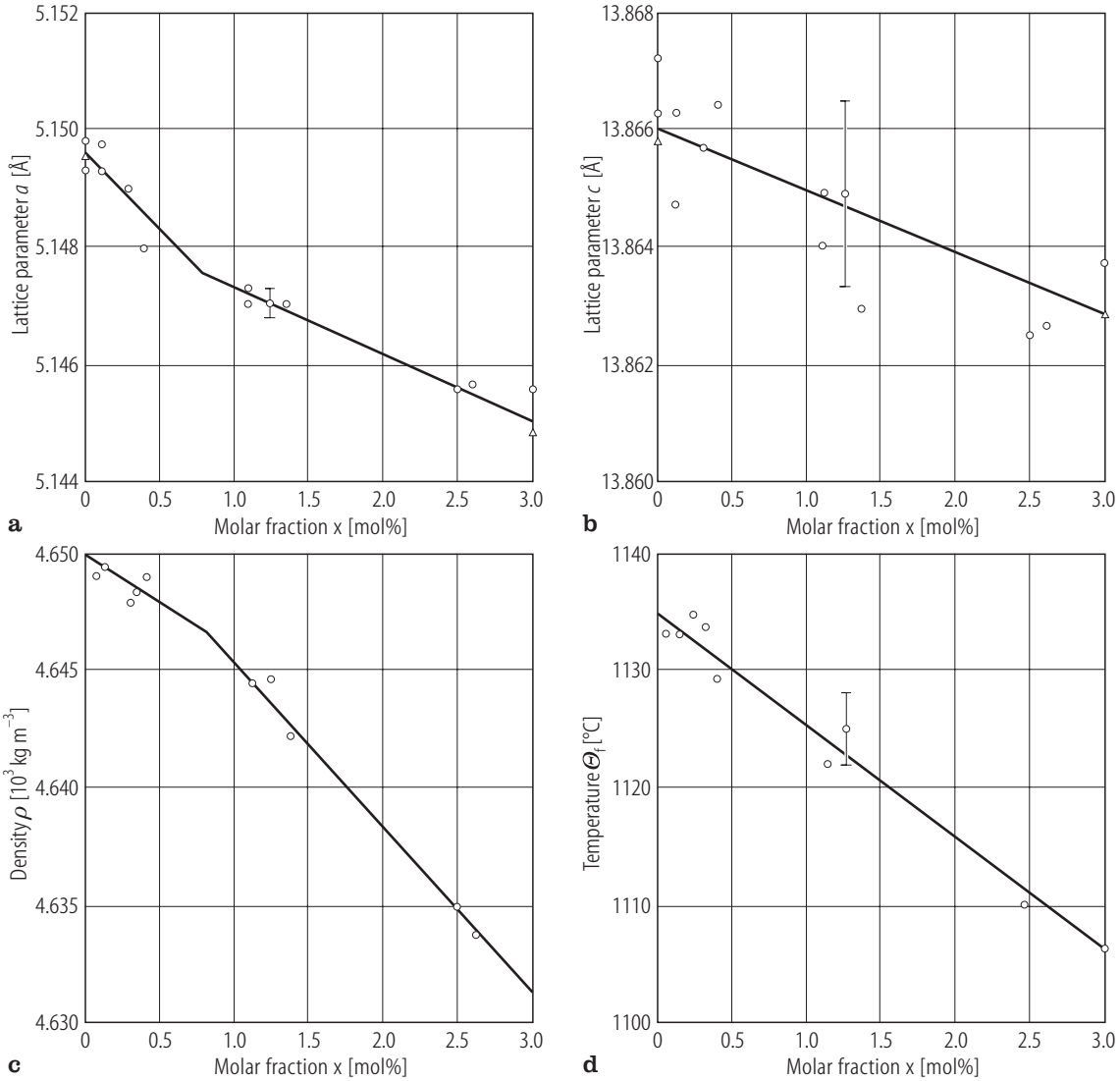

Fig. 2B-4-005. $LiNbO_3$:TiO_2. *a*, *c*, ρ, Θ_f vs. x [89Atu]. (**a**) *a*; (**b**) *c*; (**c**) ρ; (**d**) Θ_f. x: TiO_2 mol% content.

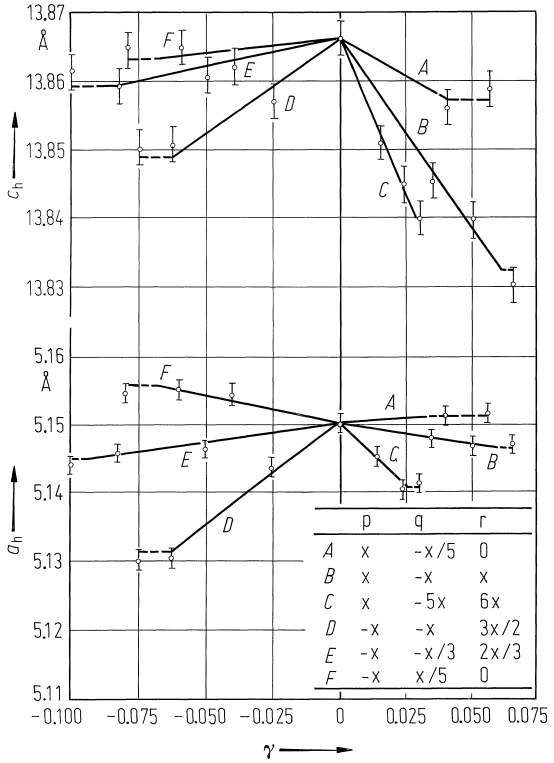

Fig. 2B-4-006. $Li_{1+p}Nb_{1+q}Ti_rO_3$. Unit cell parameters vs. γ [86Elo]. γ: stoichiometry deviation given by p + q + r. Parameter: composition.

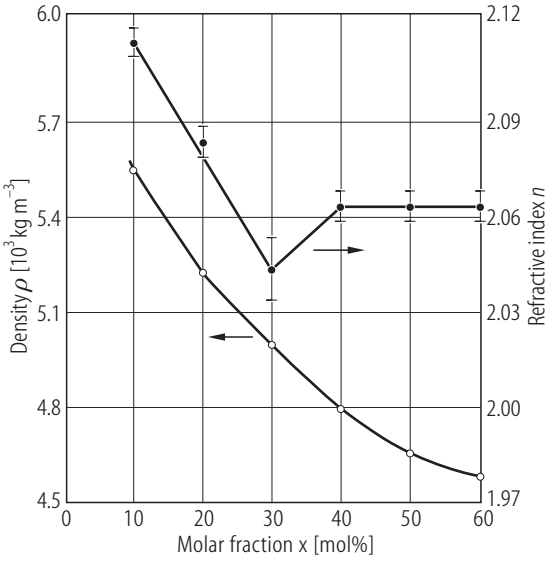

Fig. 2B-4-007. (1−x)TeO_2·x $LiNbO_3$ (amorphous). ρ, n vs. x [91Kom]. ρ: density. n: refractive index at λ = 632.8 nm.

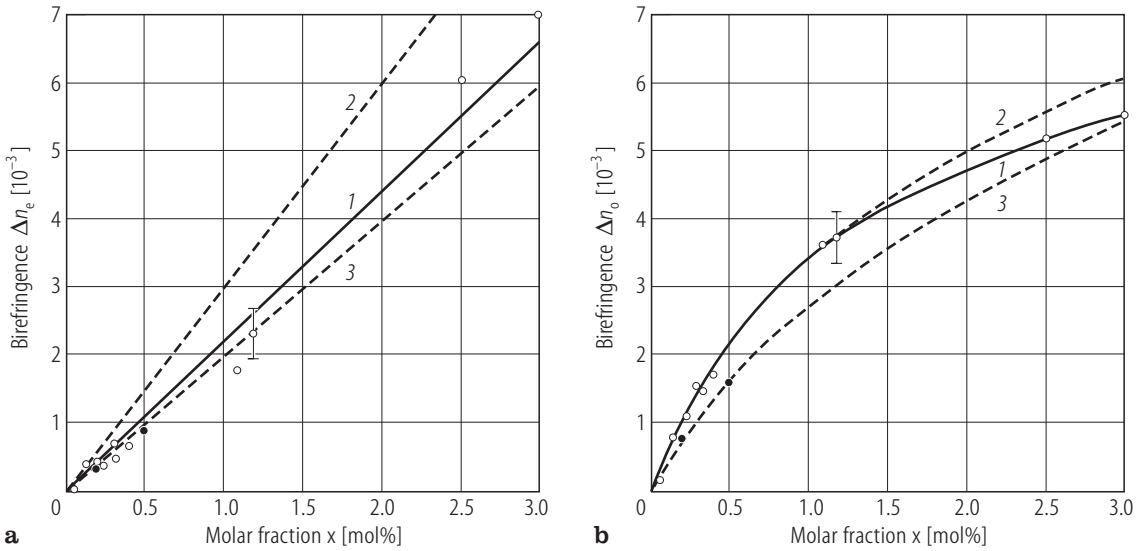

Fig. 2B-4-008. $LiNbO_3$:TiO_2. Δn_e, Δn_o vs. x [89Atu]. x: TiO_2 mol% content. The numbers *1*, *2*, *3* correspond to crystals of different origins.

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