

No. 22A-2 TlInS₂, Thallium indium sulfide*(M* = 383.34)

1a	Ferroelectricity in β -TlInS ₂ was found by Aliev et al. in 1984.							84Ali	
b	phase	VII	VI	V	IV	III	II	I	
	state	F	F	F					95All
	crystal system							mono-clinic	
	space group							C2/c–C _{2h} ⁶	
	Θ [K]	79 °)	195 °)	201 ° ^b)	204 ° ^b)	206 °)	216 ° ^a)		a) 84Vak b) 92Sal c) 95All
	$T_{\text{melt}} \approx 760$ °C. Color: yellow-orange. Transition temperature vs. pressure: Fig. 22A-2-001.								75Isa
2a	Synthesis and crystal growth by Stockbarger method: see Bridgman method (in evacuated quartz ampoules): see							75Isa 84Ali, 82Hen	
3a	Unit cell parameters: $a = 10.95$ Å, $b = 10.95$ Å, $c = 15.14$ Å, $\beta = 100^\circ$ at RT.							74Mul, 82Hen	
b	$Z = 16$ at RT.							82Hen	
4	Lattice parameter vs. temperature: Fig. 22A-2-002, Fig. 22A-2-003, Fig. 22A-2-004. Thermal expansion coefficient: Fig. 22A-2-005.								
5a	Dielectric constant: Fig. 22A-2-006, Fig. 22A-2-007, Fig. 22A-2-008, Fig. 22A-2-009. Curie-Weiss law: $\Theta_p \approx 202$ K, $C = 5.3 \cdot 10^3$ K. Effect of hydrostatic pressure: Fig. 22A-2-010. See Fig. 22A-2-020 in 5c about the dielectric constant below 90 K. Dielectric dispersion: Fig. 22A-2-011, Fig. 22A-2-012, Fig. 22A-2-013, Fig. 22A-2-014. Thermal hysteresis of dielectric constant: Fig. 22A-2-015. Dielectric constant with impurity: Fig. 22A-2-016, Fig. 22A-2-017, Fig. 22A-2-018.							84Ali	
c	Spontaneous polarization and coercive field, and pyroelectric coefficient: $P_s \approx 2 \cdot 10^{-3}$ C m ⁻² , $E_c \approx 3.5 \cdot 10^4$ V m ⁻¹ (at ≈ 160 K). Fig. 22A-2-019, Fig. 22A-2-020, Fig. 22A-2-021.							84Ali	
8a	Elastic constant vs. temperature: Fig. 22A-2-022.								
9a	Optically positive (slightly biaxial). $2V = 4.5^\circ$ at 20 °C. Transmission vs. λ : see Infrared active mode: see Absorption spectra and absorption edge: Fig. 22A-2-023. Fundamental absorption edge (4.2 K...300 K): see For exciton absorption, see subsection 11 below. Far-infrared spectra: see							84Ali 75Isa 83Gas 85All 83Vol	

10a	Raman scattering intensities vs. frequency shift at various geometries: Fig. 22A-2-024, Fig. 22A-2-025, Fig. 22A-2-026, Fig. 22A-2-027, Fig. 22A-2-028, Fig. 22A-2-029, Fig. 22A-2-030, Fig. 22A-2-031. See also Pressure dependence of Raman active mode (110 K, 300 K): see	88Bur 75Isa, 82Hen
b	Brillouin scattering: Fig. 22A-2-032.	
11	Resistivity: $10^5 \dots 10^6 \Omega\text{m}$. I vs. V characteristics during light illumination: see Exciton absorption, band gap: see	79Aga 79Aga 84All, 94Kal
14a	Incommensurate diffraction by neutrons: see	84Vak