

22 TlInS₂ family

22A Pure compounds

No. 22A-1 TlGaS₂, Thallium gallium sulfide

($M = 338.2$)

1b	Crystal system and space group: monoclinic, C2/c–C _{2h} ⁶ at RT. There is a phase transition at about 121 K. $\rho_x \approx 5.72 \cdot 10^3 \text{ kg m}^{-3}$. Color: yellow. Cleavage plane: (001).	82Hen 89Mal 75Isa 75Isa 93Ayd
2a	Synthesis and crystal growth by Stockbarger method (in a silica-glass tube with Ar gas): see Hydrothermal method with a solution of NaOH: see Bridgman method: see	75Isa 75Isa 84Ali, 82Hen, 93Ayd
3a	Unit cell parameters: $a = 10.40 \text{ \AA}$, $b = 10.40 \text{ \AA}$, $c = 15.17 \text{ \AA}$, $\beta = 100^\circ$ at RT.	74Mul, 82Hen
b	$Z = 16$ at RT.	82Hen
4	Lattice parameter vs. temperature: Fig. 22A-1-001, Fig. 22A-1-002.	
5a	Dielectric constant: Fig. 22A-1-003. $C = 3 \cdot 10^4 \text{ K}$.	84Ali
6a	Heat capacity vs. T : no abrupt anomaly between 3 K and 300 K.	84Abd
9a	Optical transmission spectra: transparent range is approximately $\lambda = 500 \text{ nm} \dots 12500 \text{ nm}$. Infrared reflectivity vs. ν : see	75Isa 83Gas
10a	Raman spectra: Fig. 22A-1-004. See also Pressure dependence of the Raman active mode (at 300 K and 110 K): see	83Gas 82Hen
b	Brillouin scattering of LA mode: Fig. 22A-1-005.	
11	Semiconductive behaviour: see	89Mal