

No. 33A-4 TIH₂PO₄, Thallium dihydrogen phosphate (TDP)

(M = 301.37; [D:303.38])

1a	Phase transition of TiH_2PO_4 was first clearly shown by P.V. Huong et al. in 1976. * Antiferroelectric D – E double hysteresis loop was observed in TlD_2PO_4 in phase III by Narasaiah et al.				76Huo 87Nar
b	phase	III	II	I	^{a)} 87Nar
	state	[D: A] ^{a)}		P	^{b)} 76Huo
	crystal system	[D: orthorhombic] ^{b)}	monoclinic	orthorhombic ^{c)}	^{c)} 94Mat
	space group	[D: Pnma – D_{2h}^{16}] ^{b)}	$\text{P2}_1/\text{a}$ – C_{2h}^5 ^{d)}	Pcan – D_{2h}^{14} ^{d)}	^{d)} 79Odd ^{c)} 77Mat
	θ [K]	229.76(5) ^{c)} [D: 350] ^{e)}		357 ^{f)}	^{f)} 84Yos ^{e)} 76Vig
	Phase diagram in regard to p : see Fig. 33A-4-012 in 5a. $\rho = 4.752 \cdot 10^3 \text{ kg m}^{-3}$. $\rho_{\text{X}} = 4.714 \cdot 10^3 \text{ kg m}^{-3}$ in phase I (373 K). * Measurement of the dielectric constant: see It does not seem to have been detailed enough to detect the phase transition.				72Odd 94Mat 47Mat
2a	Crystal growth: slow evaporation or cooling of aqueous solution.				76Huo
3a	Unit cell parameters: $a = 14.191(3) \text{ \AA}$, $b = 4.477(2) \text{ \AA}$, $c = 6.456(2) \text{ \AA}$, $\beta = 91.70(3)^\circ$ at RT. $a = 14.386(3) \text{ \AA}$, $b = 4.522(11) \text{ \AA}$, $c = 6.525(2) \text{ \AA}$ at 373 K (phase I).				79Odd 94Mat
b	$Z = 4$ at RT (phase II) [D: $Z = 8$ at RT (phase III)]. $Z = 4$ at 373 K (phase I). Crystal structure: Fig. 33A-4-001, Fig. 33A-4-002. Fractional coordinates and temperature parameters: Table 33A-4-001, Table 33A-4-002, Table 33A-4-003, Table 33A-4-004, Table 33A-4-005. Interatomic distances and bond angles: Table 33A-4-006, Table 33A-4-007, Table 33A-4-008.				79Odd 94Mat
5a	κ vs. T : Fig. 33A-4-003, Fig. 33A-4-004, Fig. 33A-4-005, Fig. 33A-4-006, Fig. 33A-4-007. Curie-Weiss plot: Fig. 33A-4-008. Effect of hydrostatic pressure: Fig. 33A-4-009, Fig. 33A-4-010. Dielectric dispersion: Fig. 33A-4-011. Phase diagram in regard to p : Fig. 33A-4-012. $d\theta/dp = -100 \text{ K GPa}^{-1}$ [D: -35 K GPa^{-1}].				80Yas1
6a	Heat capacity: Fig. 33A-4-013. Anomalous entropy: Fig. 33A-4-014.				
8a	Elastic stiffness: Fig. 33A-4-015. Sound velocity: Fig. 33A-4-016.				
10a	Raman scattering: Fig. 33A-4-017; see also				76Vig
b	Brillouin scattering: Fig. 33A-4-018, Fig. 33A-4-019.				
13a	NQR of ^{17}O : Fig. 33A-4-020, Fig. 33A-4-021, Fig. 33A-4-022. Spin-lattice relaxation time: Fig. 33A-4-023.				
14a	Superlattice reflections: Fig. 33A-4-024. ($h + 1/2$, $k + 1/2$, l) type reflections appear below 230 K [D: 350K].				81Nel1
15b	Effect of external stress on the domain structure: see				84Yos