

substance: TmTe

property: crystal structure, physical properties

crystal structure cubic ($O_h^5 - Fm3m$)

lattice parameters

a	6.049...6.364 Å	64I
	6.353 Å	79K
	6.26...6.35 Å	83O

melting point

T_m	2143 (3) K	78F
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energy gap

E_g	0.35 eV	optical determination	75S
	0.22 eV	absorption	71B
	0.32(4) eV	optical determination	79B
dE_g/dp	– 10 meV kbar ^{–1}		71B, 79B

bulk modulus

B_0	460(50) kbar	74J
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elastic moduli

c_{11}	1020 kbar	77O
c_{12}	60 kbar	
c_{44}	186 kbar	

phonon wavenumbers

$(\nu/c)_{TO}$	115(2) cm ^{–1}	IR reflectivity	75W
$(\nu/c)_{LO}$	146(2) cm ^{–1}		

dielectric constants

$\epsilon(0)$	7.2	76D
$\epsilon(\infty)$	4.5	

activation energy for conductivity

E_A	0.2 eV	75B
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resistivity

ρ	0.77 Ω cm	nonstoichiometric Tm _{0.94} Te	83O
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Figures and further references:

semiconductor-metal transition in TmSe_{1–x}Te_x at x = 0.5 [80B]; Tm-valency [83O]

XPS spectrum: Fig. 1

schematic **energy level diagram:** Fig. 2

temperature dependence of **thermal expansion** for Tm_{0.94}Te: Fig. 3

molar **heat capacity:** Fig. 4

far-infrared **reflectivity:** Fig. 5; reflectivity: Fig. 6

temperature dependence of **resistivity:** Fig. 7

References:

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Fig. 1.

TmTe. The XPS spectrum (electron intensity vs. binding energy) showing features of Tm^{2+} and Tm^{3+} [74C].

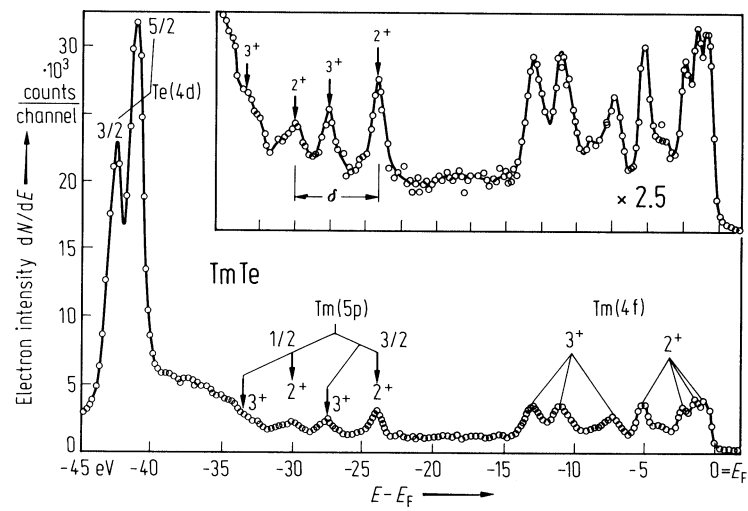


Fig. 2.

TmTe. Schematic energy level diagram [75S].

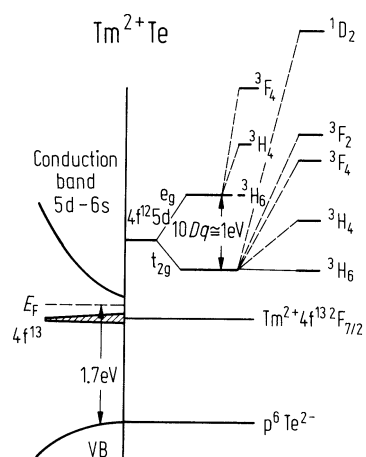


Fig. 3.

Tm_{0.94}Te. Temperature dependence of the thermal expansion coefficient [83O].

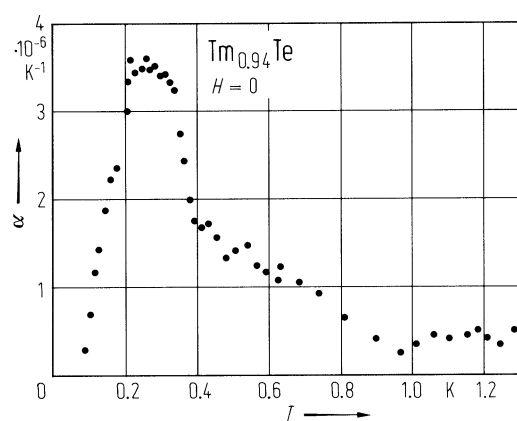


Fig. 4.

TmTe. Molar heat capacity vs. temperature [75B].

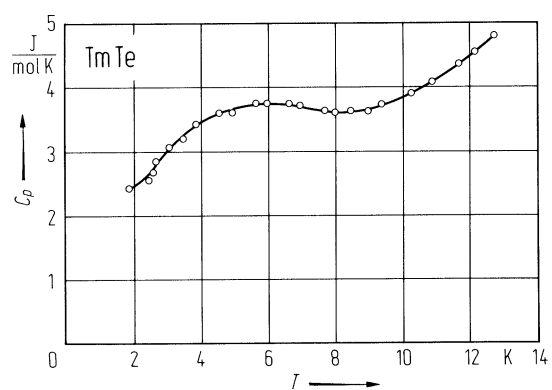


Fig. 5.

TmTe. Far-infrared reflectivity spectrum (reflectivity vs. wavenumber) at 4.5 K and 1.3 K [75W].

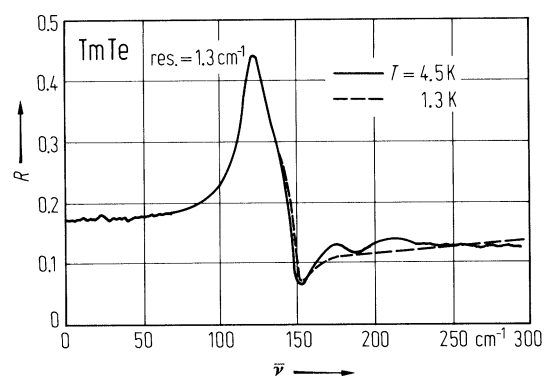


Fig. 6.

TmTe. Reflectivity vs. photon energy [76B]. Final states are indicated.

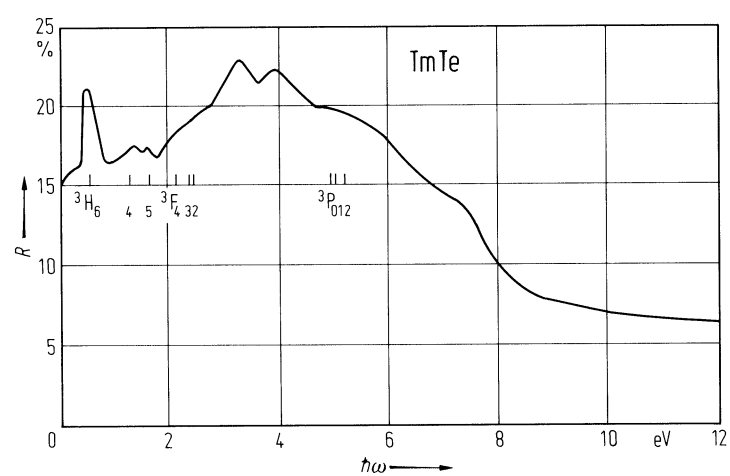


Fig. 7.

TmTe. Resistivity vs. reciprocal temperature [75B].

