substance: $IrAs_2$
property: physical properties

Energy level scheme is similar to that given for $CoAs_2$ (Fig. 1).

energy gap

E_g	1 eV	RT	from diffuse reflectance of powder samples	63H

magnetic susceptibility
(in 10^{-6} cm^3 mol^{-1}, χ in CGS units)

χ_m	– 88	T = 77 K	powder sample	63H
	– 93	T = 295 K		
	– 94	T = 80...540 K		66B
	– 118	T = 295 K	polycrystalline sample	71K
	– 108 – 0.034T	T = 80...800 K		

far infrared absorption: spectrum in the range 50...400 cm^{-1} [83L].

lattice parameters $a(T)$, $b(T)$, $c(T)$, $\beta(T)$ in the range 300...1340 K [77K].

volume expansion coefficient

β	$2.4 \cdot 10^{-5}$ K^{-1}	T = 300 K	from graphic representation, unit-cell volume linear in T	77K

The arsenopyrite structure persists up to 1340 K. The temperature of the monoclinic → orthorhombic transition is estimated from the monoclinic angle $\beta(T)$: $T_{tr} \approx 1560$ K [77K].

Comparative tables on structural data of transition metal dipnictides:

structure, chemical bond: see document ,

interatomic distances in arsenopyrite-type phases, see document .

crystallographic data: see document .

References:

63H Hulliger, F.: Phys. Lett. 4 (1963) 282.
66B Bennett, S. L., Heyding, R. D.: Can. J. Chem. 44 (1966) 3017.
71K Kjekshus, A.: Acta Chem. Scand. 25 (1971) 411.
72G Goodenough, J. B.: J. Solid State Chem. 5 (1972) 144.
77K Kjekshus, A., Rakke, T.: Acta Chem. Scand. A31 (1977) 517.
83L Lutz, H. D., Schneider, O., Kliche, G.: Phys. Chem. Minerals 9 (1983) 109.

Fig. 1.

$CoAs_2$. Energy-level scheme for the valence electrons in the arsenopyrite-type phase with formal d^5 configuration [72G].