

substance: RuP₂

property: physical properties

Energy level scheme is similar to that given for FeAs₂ (Fig. 1).

energy gap and activation energies

E_g	≈ 1 eV	RT	from diffuse reflectance of sintered samples	63H
	0.8 eV	RT	optical absorption edge determined on single crystals containing 0.85 wt% tin from flux	77K
E_A	0.01 eV	$T < 160$ K	from $\log R_H \propto E_A/kT$ in the extrinsic range at 77...300 K	77K
	0.012 eV	$T < 300$ K	from $\log \rho \propto E_A/kT$ below room temperature	

resistivity

ρ	0.09...0.26 Ω cm	RT	crystals with 0.85 wt% Sn For temperature dependence in the range 77...300 K; see Fig. 2	77K
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carrier concentration

n	$7.4 \cdot 10^{17}$ cm ⁻³	RT	from Hall coefficient ($n = 1/eR_H$)	77K
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thermoelectric power

S	-350 μ V K ⁻¹	RT	sintered samples	63H
	-170 μ V K ⁻¹	RT	single crystals	77K

magnetic susceptibility

(in 10⁻⁶ cm³ mol; χ in CGS units)

χ_m	-63	$T = 60...300$ K	Sn-containing single crystals of random orientation	77K
	-44	RT	sintered powder, Gouy method	63H
	-33	$T = 85$ K		
	-43	$T = 90$ K, $B < 0.8$ T	polycrystalline sample, Faraday method	68H
	-46	$T = 295$ K		
	-56	$T = 765$ K		

far infrared absorption: for spectrum in the range 180...500 cm⁻¹, see [77L].

Comparative tables on structural data of transition metal dipnictides:

structure, chemical bond: see document ,

crystallographical data of compounds with octahedrally coordinated cations, see document ,

interatomic distances in marcasite- and loellingite-type compounds, see document .

References:

- 63H Hulliger, F.: Nature (London) 198 (1963) 1081.
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- 72F Fan, A. K. L., Rosenthal, G. H., McKinzie, H. L., Wold, A.: J. Solid State Chem. 5 (1972) 136.
- 72G Goodenough, J. B.: J. Solid State Chem. 5 (1972) 144.
- 77K Kaner, R., Castro, C. A., Gruska, R. P., Wold, A.: Mat. Res. Bull. 12 (1977) 1143.
- 77L Lutz, M. D., Willich, P.: Z. Anorg. Allg. Chem. 428 (1977) 199.

Fig. 1.

FeAs_2 . One-electron energy levels for the valence electrons in loellingite [72F, 72G].

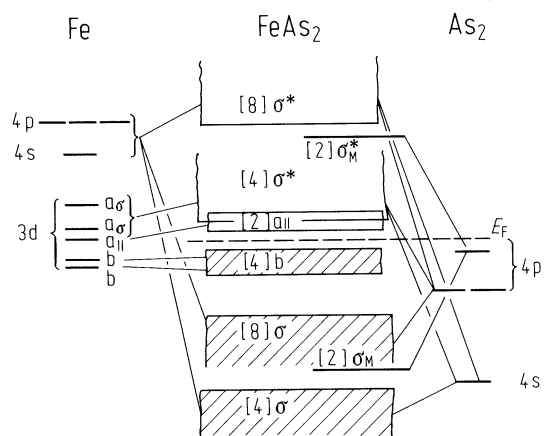


Fig. 2.

RuP_2 . Resistivity vs. reciprocal temperature [77K]. Measurements on two different single crystals containing up to 0.85 wt% Sn from the tin flux; orientation unknown.

