substance: PtP_2
property: physical properties

energy gap

$E_{g,th}$	> 0.6 eV		from log $\rho \propto E_g/2kT$ above 600 K, sintered sample	63H

resistivity: temperature dependence in the extrinsic range 77...500 K: Fig. 1.

carrier concentration

n	$4.5 \cdot 10^{18}$ cm^{-3}	T = 295 K	from Hall effect in the extrinsic range, varying from sample to sample (crystals grown from tin flux containing 0.02% Sn)	74B
	$1.8 \cdot 10^{18}$ cm^{-3}	T = 77 K		

thermoelectric power

S	– 90 μV K^{-1}	RT	single crystal from tin flux	74B
	+ 100 μV K^{-1}	RT	sintered sample	63H
	+ 150 μV K^{-1}	T = 300 K	hot-pressed at ≈ 1100K; ρ(RT) = 0.24 Ω cm	65J
	+ 180 μV K^{-1}	T = 300 K	cold-pressed and annealed at ≈ 1100 K; ρ(RT) = 30 Ω cm	

For temperature dependence of S in the range 100...900 K for a hot-pressed sample, see Fig. 2.

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

χ_m	– 64.0	T = 295 K	single crystal	74B
	– 63.5	T = 77 K	from tin flux	

thermal conductivity

κ	0.26 W cm^{-1} K^{-1}	T = 300 K	hot-pressed sample	65J

far infrared absorption: for spectrum in the range 80...440 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 pyrite- and pararammelsbergite-type compounds, see document .

References:

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65J Johnston, W. D., Miller, R. C., Damon, D. H.: J. Less-Common Met. 8 (1965) 272.
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Fig. 1.

PtP_2, $PtAs_2$, $PtSb_2$, $PtBi_2$. Resistivity vs. reciprocal temperature [65J]. The data for semimetallic pyrite-typ $PtBi_2$ (h) are added for comparison. PtP_2: hot-pressed sample; $PtAs_2$ and $PtBi_2$: sintered samples; $PtSb_2$: open triangles - polycrystalline sample, full triangles - single crystals. The broken curve shows the measurements of [66B] on a sintered $PtAs_2$ sample.

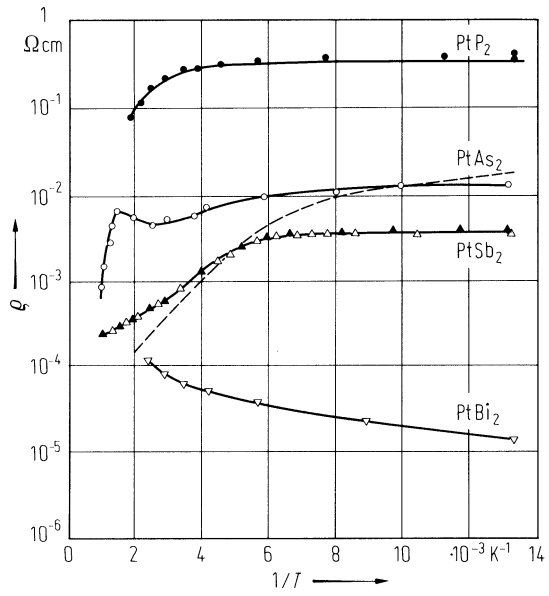

Fig. 2.

PtP_2, $PtAs_2$, $PtSb_2$, $PtBi_2$. Thermoelectric power vs. temperature [65J]. $PtSb_2$: open triangles- polycrystalline sample, full triangles-single crystal; $PtBi_2$: pyrite-type high-temperature modification.