substance: $ReSi_2$, $Re_{1-x}M_xSi_2$
property: physical properties

energy gap

$E_{g,th}$	0.13 eV	T = 0 K	from $\rho(T)$ above 500 K assuming $\log \rho \propto E_g/2kT$	65N, 61N, 60N
	0.21...0.22 eV	T = 0 K	from $\rho(T)$ in the range 500...1200 K	83S
	0.195 eV	RT	from optical reflectivity	83S

resistivity

(for temperature dependence, see Fig. 1)

ρ	0.01 Ω cm	RT	impurity conduction	61N
	0.016 Ω cm	T = 295 K	extrapolated from intrinsic range	61N
	0.003...0.01 Ω cm	RT	four-probe ac method, polycrystalline sample	83S

thermoelectric power

(see Fig. 2)

S	– 90...– 130 μV K^{-1}	$T \approx$ 310 K	polycrystallinesample	83S
	+ 80 μV K^{-1}	T = 300 K	polycrystal; p-type conduction confirmed by Hall effect; impurity concentration 10^{18} cm^{-3}	65N

magnetic susceptibility

χ_m	– 75.3 + 0.0092 T [10^{-6} cm^3 mol^{-1}]	T = 300...1000 K	polycrystalline bar, Faraday method, B = 4 kG; χ in CGS-emu	83S

dielectric constant

$\varepsilon(0)$	70	T = 0 K	extrapolated from RT reflectivity by subtracting the free-carrier contribution	83S

melting point

T_m	2253 K			61N

density

d	10.8 g cm^{-3}	T = 295 K		61N
	10.70 g cm^{-3}	T = 295 K	X-ray density	

Nonmetallic character of $ReSi_2$ questioned by [80C] based on the high atomic-volume contraction on compound formation.

$Re_{1-x}Ti_xSi_2$: solubility x ≤ 0.15 at 1370 K [64D].
$Re_{1-x}Cr_xSi_2$: solubility limit x = 0.2 [65N]; decrease of ρ, S and κ with x [65N].
$Re_{1-x}Mo_xSi_2$: complete solid solubility [64N]; smooth decrease of ρ at room temperature (i.e. in the extrinsic region) [64N].
$Re_{1-x}Mn_xSi_2$: solubility x ≤ 0.03 at 1370 K [69E].

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Fig. 1.

$ReSi_2$. Logarithmic resistivity vs. reciprocal temperature for a polycrystalline sample [65N].

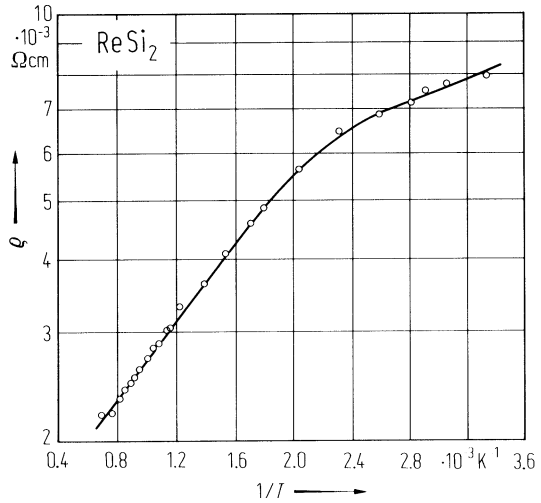

Fig. 2.

$ReSi_2$. Seebeck coefficient vs. temperature for a polycrystalline sample [65N].