substance: boron compounds with lanthanides
property: properties of lanthanide borides of the type MB_{66}: ErB_{66}, YbB_{66}

ErB_{66}

Crystal growth of ErB_{66} [99L].

YbB_{66}

energy gap

E_g	1.27 eV	el. conductivity	87G
	1.10 eV	Seebeck coeff.	86G
	1.27 eV	electrical conductivity	81G
E_A	0.10 eV	distance between mobility edge and E_F	

Transport properties (see also Figs. 1,2)

electrical conductivity

σ	$6 \cdot 10^{-3}\ \Omega^{-1}cm^{-1}$	T = 300 K	87G

Temperature dependence of cond. in Fig. 3 [87G, 86G].

thermoelectric power

S	270 μV K^{-1}	T = 300 K	87G

carrier concentration

p	$1 \cdot 10^{16}\ cm^{-3}$	T = 300 K	86G

Hall mobility

μ_H	$5\ cm^2V^{-1}s^{-1}$	T = 300 K	86G

carrier concentration p, Seebeck coefficient S, and Hall mobility μ_H (at T = 300 K)

p	$1.2 \cdot 10^{16}\ cm^{-3}$	derived from Hall effect	81G
S	+ 170 μV K^{-1}		
$\mu_{H,p}$	$5\ cm^2/V\ s$		

characteristic parameter
(T_0 (in K): parameter in Mott´s law of variable-range hopping $\sigma \propto \exp\ (T_0/T)^{1/4}$)

T_0	$1 \cdot 10^{-6}$ K	T = 300 K	86G

References:

81G Golikova, O.A., Tadzhiev, A.: J. Less-Common Met. 82 (1981) 169. (Proc. 7th Int. Symp. Boron, Borides and Rel. Compounds, Uppsala, Sweden, 1981).

86G Golikova, O.A., Tadzhiev, A.: J. Non-Cryst. Solids 87 (1986) 64.

87G Golikova, O.A.: Phys. Status Solidi (a) 101 (1987) 277.

99L Leithe-Jasper, A., Tanaka, T.: J. Solid State Chem. (2000) (Proc. 13th Int. Symp. Boron, Borides and Rel. Compounds, Dinard, France, Sept. 1999: Cryst. growth on boron carbides).

Fig. 1.

SmB_{66}, GdB_{66}, YbB_{66}. Electrical conductivity and thermoelectric power vs. carrier concentration [81G].

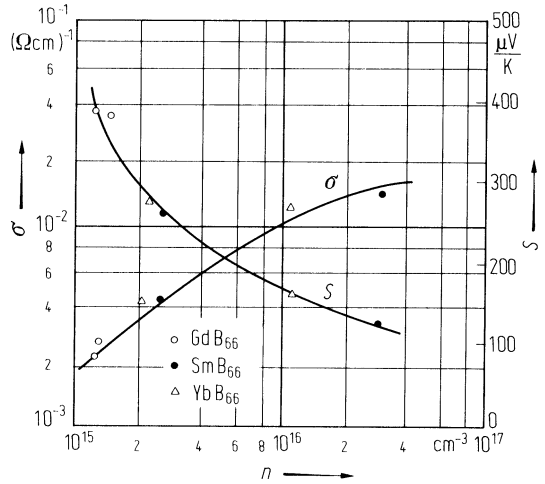

Fig. 2.

SmB_{66}, GdB_{66}, YbB_{66}. Electrical conductivity and carrier concentration (derived from Hall effect) vs. reciprocal temperature [81G].

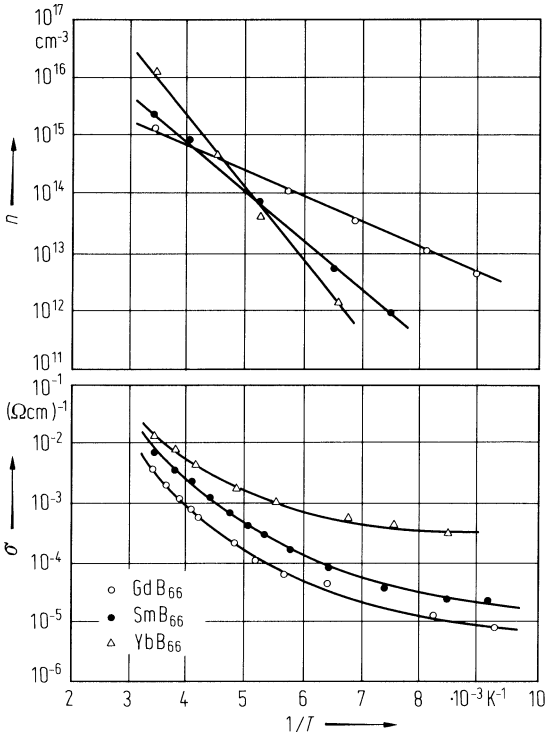

Fig. 3.

YbB_{66}. Temperature dependence of the electrical conductivity [87G, 86G].