substance: boron compounds with group II elements
property: properties of boron-zinc compounds

Only few investigations have been performed on compounds of boron with group IIb elements (see [77G] and references therein).

Crystal structure of $ZnB_{\sim 25}$ [87K].

For solid solutions of Zn in β-rhombohedral boron (interstitially doped β-rhombohedral boron) see LB III/41C.

ZnB_{22}

Structure

Since the crystalline structure deviates only insignificantly from that one of β-rhombohedral boron, the accommodation of the Zn atoms in holes of the β-rhombohedral boron structure seems probable, but the possibility of a substitution of boron atoms cannot be excluded [77G, 82L].

Physical properties

resistivity

ρ	$2.5 \cdot 10^3$ Ω cm	T = 298 K	crystalline (see Fig. 1), p-type conductivity	74K, 77G
	$2.5 \cdot 10^6$ Ω cm	T = 298 K	powder	

optical transmission: Fig. 2

magnetic susceptibility

χ_g	$-0.64(2) \cdot 10^{-6}$ cm^3 g^{-1}	T = 298 K	powder (χ_g in CGS-emu)	74K, 77G

density

d	2.86(4) g cm^{-3}	T = 298 K	powder	74K, 77G

microhardness

H	3510(210) kg mm^{-2}	load 30 g, hardness not specified	77G

References:

74K Korsukova, M. M., Gurin, V. N., Sorokin, V. N., Yusov, Yu. P., Terent'eva, S. P., in: Bor, Poluchenie, Struktura i Svoistva, Ed.: Tavadze F. N., Moscow Nauka, 1974, p. 235.

74W Werheit, H., Binnenbruck, H.: see [74K], p. 110.

77B Berezin, A. A., Golikova, O. A., Zaitsev, V. R., Kazanin, M. M., Orlov, V. M., Tkalenko, E. N., in:Boron and Refractory Borides, (Matkovich V. 1., ed.) Springer: Berlin, Heidelberg, New York 1977, p. 52.

77G Gurin, V. N., Korsukova, M. M.: see [77B], p. 293.

82L Lundström, T.: The Formation of the Bonds to the Group IIIb Elements in Inorganic Reactions and Methods, (Ed.: J. J. Zuckerman) Verlag Chemie: Weinheim, 1982.

87K Kuz'ma, Yu.B., Gurin, V.N., Korsukova, M.M., Aksel'rud, L.G.: Neorg. Mater. 23 (1987) 566.

Fig. 1.

$ZnB_{\approx 22}$. Electrical resistivity vs. reciprocal temperature for polycrystalline samples [74K].

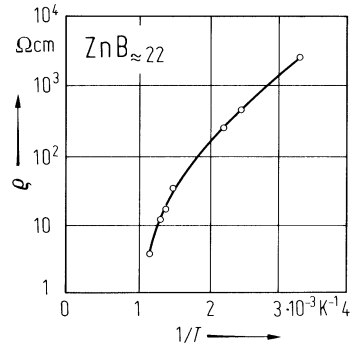

Fig. 2.

$ZnB_{22}/ZnB_{\approx 40}$. IR transmission vs. wavenumber (transmission of amorphous boron for comparison) [77G].