

substance: boron compounds with group VIII elements

property: properties of boron-cobalt compounds

Co₇₇B₂₃

Crystallization mechanism of Co₇₇B₂₃ amorphous alloy [99A].

Co₃B, Co₂B

Metallic; preparation [75S], crystalline structure [75S, 77L], electronic structure [77S], electronic transport [75S], magnetic properties [77B2]

RCo₄B compounds

Magnetic properties of RCo₄B compounds (R = Y, Pr, Nd, Sm, Gd, Tb)[99C].

Antiferromagnetic ordering in the ternary rare earth cobalt borides RCo₄B₄ (R = Ce, Gd, Tb, Dy, Ho, Er, Tm, Lu) [87K].

Co₁₄Pr₂B

Preparation and structure of the compound and of the related hydrides in [97K].

Co₁₄La₂B

Preparation and structure of the compound and of the related hydrides in [97K].

Co₄YB

Preparation and structure of the compound and of the related hydrides in [97K].

Co₄LaB

Preparation and structure of the compound and of the related hydrides in [97K].

Co₄CeB

Preparation and structure of the compound and of the related hydrides in [97K].

Co₄PrB

Preparation and structure of the compound and of the related hydrides in [97K].

Co₄HoB

Preparation and structure of the compound and of the related hydrides in [97K].

Co₄ErB

Preparation and structure of the compound and of the related hydrides in [97K].

Co_{100-x}B_x (31 ≥ x ≥ 17)

Glassy alloys; metallic; IR optical properties with plasma edge in [94K].

Co_{3-x}Fe_xB

Hyperfine fields and site preference in crystalline and amorphous Co_{3-x}Fe_xB [87R].

CoB

Semiconducting?; preparation [75S], crystalline structure [77S], electronic transport [75B], magnetic properties [73B]

CoB₁₂

Semiconducting; preparation [79A], electronic transport [79A]

Structural similarity to WB_{12} is stated, the semiconducting behavior according to the temperature dependence of the electrical conductivity and the thermoelectric power is proved, but no concrete data are reported [79A].

microhardness

H	3600... 3800 kg mm ⁻²	$T = 300 \text{ K}$	load 50 g, (type not specified)	79A
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$\text{YCo}_{12}\text{B}_6$

Structure: hexagonal ($\text{SrNi}_{12}\text{B}_6$ type) [98K].

lattice parameters

a	9.443 Å	$T = 300 \text{ K}$	X-ray diffraction	98K
c	7.435 Å			

Normalized resistance and Seebeck coefficient in Fig. 1 [98K].

Magnetic properties, specific heat and critical behavior in [88R, 89M, 95N, 97L].

$\text{GdCo}_{12}\text{B}_6$

structure: hexagonal ($\text{SrNi}_{12}\text{B}_6$ type) [98K].

lattice parameters

a	9.454 Å	$T = 300 \text{ K}$	X-ray diffraction	98K
c	7.435 Å			

Normalized resistance and Seebeck coefficient in Fig. 1 [98K].

Magnetic properties, specific heat and critical behavior in [88R, 89M, 95N, 97L].

quaternary compounds

Co-Ni-Si-B alloys

Effect of heat treatment and the magnetic properties in [87M].

Effect of boron on the magnetism of amorphous $(\text{FeNi})_{78}(\text{SiB})_{22}$ alloys in [87G].

$\text{CeCo}_2\text{Fe}_2\text{B}$; CeCoFe_3B

Preparation and structure of the compound and of the related hydrides in [97K].

compounds with more than four components

Magnetic properties of compounds consisting of Nd, Fe, Co, Mo, V, Al besides of B in [87L].

References:

- 73B Budozhapov, V. D., Zelenin, L. P., Chemerinskaya, L. S., Sidorenko, F. A., Gel'd, P. V.: *Izv. Akad. NAUK SSSR Neorg. Mater.* 9 (1973) 1447.
- 75B Budozhapov, V. D., Sidorenko, F. A., Zelenin, L. P., Gel'd, P. V., Chemerinskaya, L. S.: *Izv. Akad. Nauk SSSR Neorg. Mater.* 11 (1975) 173.
- 75S Samsonov, G. V., Serebryakova, T. I., Neronov, V. A.: *Boridy*, Moskva Atomizdat, 1975.
- 77B1 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.
- 77B2 Busehow, K. H. J.: see [77B1], p. 494.
- 77L Lundström, T.: see [77B1], p. 351.
- 77S Samsonov, G. V., Kovenskaya, B. A.: see [77B1], p. 5.
- 79A Avlokhavili, J. A., Tavadze, F. N., Tavadze, G. F., Tsikaridze, D. N., Gabunia, D. L., Tsomaya, K. P.: *J. Less Common Met.* 67 (1979) 367.
- 87G Guan, K., Zhu, H.: in: *Proc. 9th Int. Symp. Boron, Borides and Rel. Compounds*, University of Duisburg, Germany, Sept. 21 - 25, 1987, H. Werheit ed., University of Duisburg: Duisburg, 1987, p. 401.
- 87K Ku, H.C., Tai, M.F., Klavins, P., Shelton, R.N.: *Jpn. J. Appl. Phys. Suppl.* 26 (1987) 827.
- 87L Lian, F., Ai, L., Zhand, X., Zhao, H.: in: *Proc. 9th Int. Symp. Boron, Borides and Rel. Compounds*, University of Duisburg, Germany, Sept. 21 - 25, 1987, H. Werheit ed., University of Duisburg: Duisburg, 1987, p. 403.
- 87M Mucha, J.M., Szytula, A.: in: *Proc. 9th Int. Symp. Boron, Borides and Rel. Compounds*, University of Duisburg, Germany, Sept. 21 - 25, 1987, H. Werheit ed., University of Duisburg: Duisburg, 1987, p. 399.
- 87R Ressler, L., Rosenberg, M., Fukamichi, K.: in: *Proc. 9th Int. Symp. Boron, Borides and Rel. Compounds*, University of Duisburg, Germany, Sept. 21 - 25, 1987, H. Werheit ed., University of Duisburg: Duisburg, 1987, p. 397.
- 88R Rosenberg, M., Mittag, M., Bushow, K.H.J.: *J. Appl. Phys.* 63 (1988) 3586.
- 89M Mittag, M., Rosenberg, M., Bushow, K.H.J.: *J. Magn. Magn. Mater.* 82 (1989) 109.
- 94K Khan, M.S., Shamim, A., Rizvi, T.Z.: *Proc. 11th Int. Symp. Boron, Borides and Rel. Compounds*, Tsukuba, Japan, August 22 - 26, 1993, *Jpn. J. Appl. Phys. Series 10* (1994) p. 241.
- 95N Nahm, K., Kim, C.K., Mittag, M., Jeong, Y.H.: *J. Appl. Phys.* 78 (1995) 3980.
- 97K Kramp, S., Febri, M., Joubert, J.C.: *J. Solid State Chem.* 133 (1997) 145 (*Proc. 12th Int. Symp. Boron, Borides and Rel. Compounds*, Baden, Austria, 1996).
- 97L Lee, S.P., Kim, C.K., Nahm, K., Mittag, M., Jeong, Y.H., Ryu, C.M.: *J. Appl. Phys.* 81 (1997) 2454.
- 98K Kim, C.O., Park, J.S., Choi, E.S., Park, Y.W., Jeong, Y.H., Ryu, C.-M., Kim, C.K., Nahm K.: *Phys. Status Solidi (b)* 208 (1998) 129.
- 99A Ajmal, M., Khan, M.S., Shamin, A.: *J. Solid State Chem.* (2000) (*Proc. 13th Int. Symp. Boron, Borides and Rel. Compounds*, Dinard, France, Sept. 1999).
- 99C Chacon, C., Isnard, O.: *J. Solid State Chem.* (2000) (*Proc. 13th Int. Symp. Boron, Borides and Rel. Compounds*, Dinard, France, Sept. 1999).

Fig. 1.

$\text{RECo}_{12}\text{B}_6$ (RE = Y, Gd). **(a)** Thermoelectric power S and **(b)** normalized resistance vs. temperature. The arrows indicate the magnetic transition temperatures. The solid lines are linear interpolations between $S(T = 0)$ and $S(T = T_c)$ [98K].

