



CAS Registry Number: 12045-71-5

Molecular Formula: B₄Cr₃

Molecular Weight: 199.232

Accurate Mass: 199.858747

Percentage Composition: B 21.71%; Cr 78.29%

General Statement: Ta₃B₄-type struct. Orthorhombic

Source/Synthesis: Synth. from Cr₂O₃ + B at 1600° or from Cr + B

Physical Description: Thin plates or thick trapezoidal plates

Melting Point: Mp 1950°

>>**Variant: Chromium boride (Cr₂B₃),** 9Cl, 8Cl

Synonym(s): Dichromium triboride

CAS Registry Number: 100629-17-2

Molecular Formula: B₃Cr₂

Molecular Weight: 136.425

Accurate Mass: 136.908933

Percentage Composition: B 23.77%; Cr 76.23%

General Statement: Orthorhombic lattice

Source/Synthesis: Synth. from Cr + B in Al at ≤ 1500°

Other Data: Reacts with HF + HNO₃ + H₂SO₄ at 150°

>>**Variant: Chromium boride (CrB₂),** 9Cl, 8Cl

Synonym(s): Chromium diboride

CAS Registry Number: 12007-16-8

Molecular Formula: B₂Cr

Molecular Weight: 73.618

Accurate Mass: 73.959119

Percentage Composition: B 29.37%; Cr 70.63%

General Statement: Hexagonal AlB₂-type struct. Also described as orthorhombic Mn₄B type

Source/Synthesis: Synth. from Cr₂O₃ + B at 1600° or Cr₂O₃ + B₂O₃/Mg at 1200°, or BCl₃ + Cr₂S₃ under H₂ at 700-900°

Physical Description: Hard and metallic dendritic or hexagonal planar cryst. or hexagonal prisms

Melting Point: Mp 2130°

Other Data: When finely divided, begins to oxidise in air at *ca.* 650°. Dissolves in H₂SO₄ aq. (1:2) and hot HNO₃. Stable to 5-20% NaOH aq., but added H₂O₂ accelerates dec. Attacked by fused NaOH

Aldrich: 33675-0

References:

- Gmelin Handbook Inorg. Chem., Syst. No. 52, 1962, 344, (rev, bibl)
Peshev, P. *et al.*, *J. Less-Common Met.*, 1967, **13**, 241, (synth, anal)
Serebryakova, T.I. *et al.*, *Zh. Prikl. Khim. (Leningrad)*, 1967, **40**, 3; *J. Appl. Chem. USSR (Engl. Transl.)*, 1967, **40**, 1, (synth)
Meerson, G.A. *et al.*, *Izv. Akad. Nauk SSSR, Neorg. Mater.*, 1969, **5**, 2075; *Inorg. Mater. (Engl. Transl.)*, 1969, **5**, 1767, (synth, purif)
Markovskii, L.Ya. *et al.*, *Poroshk. Metall. (Kiev)*, 1969, **9**, 13; *Sov. Powder Metall. Met. Ceram. (Engl. Transl.)*, 1969, **9**, 350, (synth)
Cueilleron, J. *et al.*, *J. Less-Common Met.*, 1971, **24**, 317, (synth)
Marek, E.V. *et al.*, *Poroshk. Metall. (Kiev)*, 1971, **11**, 70; *Sov. Powder Metall. Met. Ceram. (Engl. Transl.)*, 1971, **10**, 138
Kugai, L.N., *Izv. Akad. Nauk SSSR, Neorg. Mater.*, 1972, **8**, 769; *Inorg. Mater. (Engl. Transl.)*, 1972, **8**, 669, (props)
Creel, R.B. *et al.*, *J. Chem. Phys.*, 1972, **56**, 1549, (nqr, cryst struct)
Karasev, A.I. *et al.*, *Poroshk. Metall. (Kiev)*, 1973, **12**, 1; *Sov. Powder Metall. Met. Ceram. (Engl. Transl.)*, 1973, **12**, 777, (manuf)
Mavel, G. *et al.*, *Surf. Sci.*, 1973, **35**, 109, (pe)
Cruceanu, E. *et al.*, *J. Less-Common Met.*, 1975, **41**, 339, (synth, Cr₅B₃)
Guy, C.N. *et al.*, *J. Less-Common Met.*, 1976, **48**, 199, (phase diagram, single cryst)
Tanaka, T. *et al.*, *J. Less-Common Met.*, 1976, **50**, 15, (synth, single cryst, magnetic/electrical props)
Boron Refract. Borides, (Ed. Matkovich, V.I.), Springer-Verlag, Berlin, 1977, 361, (rev, bibl)
Kitaoka, Y. *et al.*, *Solid State Commun.*, 1978, **26**, 87, (B-11 nmr)
Aleshin, V.G. *et al.*, *J. Less-Common Met.*, 1979, **67**, 173, (pe)
Matojima, S. *et al.*, *J. Cryst. Growth*, 1981, **51**, 568, (synth, single cryst, struct)
Hamar, R. *et al.*, *J. Cryst. Growth*, 1983, **63**, 365, (morphology)
Okada, S. *et al.*, *J. Solid State Chem.*, 1987, **68**, 61, (cryst struct, CrB, Cr₃B₄, Cr₂B₃)