



>>Entry Name: Chromium(III) bromide (CrBr₃)

Synonym(s): Chromium tribromide. Chromic bromide

CAS Registry Number: 10031-25-1

CrBr₃

Molecular Formula: Br₃Cr

Molecular Weight: 291.708

Accurate Mass: 288.755517

Percentage Composition: Br 82.18%; Cr 17.82%

General Statement: BiI₃-type layer struct. Interatomic distance Cr-Br 257 pm

Source/Synthesis: Can be synth. electrochemically using Cr anode and liq. Br₂

Physical Description: Dark green cryst. Easily oxidised in air; easily reduced by H₂

Melting Point: Mp 812° (1130° est.)

Solubility: Insol. cold H₂O; sol. C₆H₆

Other Data: μ_{eff} = 3.94μ_B (θ -51, 298K). Ferromagnetic. Begins to dissoc. at 700°

>>Variant: Chromium(III) bromide hexahydrate

CAS Registry Number: 13478-06-3

Molecular Formula: Br₃CrH₁₂O₆

Molecular Weight: 399.799

Accurate Mass: 396.818907

Percentage Composition: Br 59.96%; Cr 13.01%; H 3.03%; O 24.01%

>>Derivative: Violet form

Synonym(s): Hexaaquachromium(3+) tribromide

Physical Description: Blue-grey-violet cryst.

Solubility: V. sol. H₂O; insol. EtOH

>>Derivative: Green form

Synonym(s): Tetraaquadibromochromium(1+) bromide dihydrate

CAS Registry Number: 82676-67-3

Source/Synthesis: Synth. from CrO₃ and excess 50% HBr

Physical Description: Green deliquescent cryst.; stable in solid state

Solubility: Sol. H₂O, EtOH; insol. Et₂O

Other Data: On warming in soln., converts to violet form

References:

Gmelin Handbook Inorg. Chem., Syst. No. 52, 1962, 282, (rev, bibl)

Fergusson, J.E., *Halogen Chem.*, (Ed. Gutmann, V.), Academic Press, London, 1967, **3**, 234, (rev, bibl)

Rupcheva, V.A. *et al.*, *Zh. Neorg. Khim.*, 1970, **15**, 324; *Russ. J. Inorg. Chem. (Engl. Transl.)*, 1970, **15**, 170, (thermal dec)

Brauer, G., *Handbuch Prap. Anorg. Chem.*, 3rd edn., Ferdinand Enke Verlag, 1975, **3**, 1487, (synth)

Inorg. Synth., 1979, **19**, 123, (electrochem synth)

Klinkova, L.A. *et al.*, *Izv. Akad. Nauk SSSR, Neorg. Mater.*, 1980, **16**, 1777; *Inorg. Mater. (Engl. Transl.)*, 1980, **16**, 1207, (props)

Gregory, P.D. *et al.*, *J.C.S. Dalton*, 1995, 1423, (vaporisation)