



>>Entry Name: Platinum sulfides

CAS Registry Number: 12627-62-2

Related CAS Registry Numbers(s): 12608-27-4

Molecular Formula: [PtS]

>>Variant: Platinum sulfide (PtS), 9CI

Synonym(s): Cooperite

CAS Registry Number: 12038-20-9

Molecular Formula: PtS

Molecular Weight: 227.146

Accurate Mass: 226.936836

Percentage Composition: Pt 85.88%; S 14.12%

Source/Synthesis: Synth. from Platinum(II) chloride (PtCl₂) [HPT30-X](#) + S + Na₂CO₃ or Platinum [JCC22-Y](#) + S. Occurs as mineral associated with native Pt and precious metal ores

Use/Importance: Used for electrochromic display devices

Physical Description: Green powder; steel grey metallic cryst.

Solubility: Sol. aq. (NH₄)₂S

Other Data: Reduced to Pt by air, H₂

>>Variant: Platinum sulfide (Pt₂S₃)

CAS Registry Number: 12137-85-8

Molecular Formula: Pt₂S₃

Molecular Weight: 486.358

Accurate Mass: 485.845742

Percentage Composition: Pt 80.22%; S 19.78%

Source/Synthesis: Obt. by oxidation of H₂Pt₄S₆

Physical Description: Steel grey powder

>>Variant: Platinum sulfide (PtS₂), 9CI

Synonym(s): Platinum disulfide

CAS Registry Number: 12038-21-0

Molecular Formula: PtS₂

Molecular Weight: 259.212

Accurate Mass: 258.908906

Percentage Composition: Pt 75.26%; S 24.74%

Source/Synthesis: Synth. from Platinum [JCC22-Y](#) + S or NH₄ salt of Hexachloroplatinate(IV)(2-) [JCX41-E](#) + S

Physical Description: Steel grey solid plates

Solubility: Sol. HNO₃

Other Data: Dec. at 225-250°. Less stable if made in H₂O. Forms solid solns. with PtSe₂, PtTe₂. Semiconductor between 77 and 300K, *E*_{act} 0.1eV

Aldrich: 39848-9

References:

Tamman, G. von., *Z. Anorg. Allg. Chem.*, 1921, **116**, 210, (*Pt₂S₃*)

Biltz, W. von. *et al.*, *Z. Anorg. Allg. Chem.*, 1930, **190**, 171, (*PtS₂*, *PtS*)

Mellor Compr. Treat. Inorg. Theor. Chem., 1937, **16**, 393, (*rev*)

Gmelin Handbook Inorg. Chem., Syst. No. 68, 1940, 103, (*rev, bibl*)

Sidgwick, N.V., *The Chemical Elements and their Compds.*, Oxford, 1950, 1581; 1614

Furuse, S. *et al.*, *Acta Chem. Scand.*, 1965, **19**, 257, (*PtS₂*, *cryst struct*)

Zwingmann, G. *et al.*, *Metall (Berlin)*, 1971, **25**, 1121, (*Pt-S system*, *Pt₃S*)

Inorg. Synth., 1979, **19**, 49, (*PtS₂*, *synth*)

Wells, A.F., *Structural Inorg. Chem.*, 5th Ed., Oxford, 1984, 755; 757, (*struct*)

Kliche, G., *Infrared Phys.*, 1985, **25**, 381, (*ir*)

Kliche, G., *J. Solid State Chem.*, 1985, **56**, 26, (*solid solns*)