



>>Entry Name: Titanium sulfides

Related CAS Registry Numbers(s): 127482-71-7 127482-72-8

Molecular Formula: [STi]

>>Variant: Titanium sulfide (TiS)

CAS Registry Number: 12039-07-5

Molecular Formula: STi

Molecular Weight: 79.946

Accurate Mass: 79.920017

Percentage Composition: S 40.11%; Ti 59.89%

Source/Synthesis: Synth. by direct reaction of the elements or by thermal dec. of Ti(Bu S)₄ at 130-200°. The latter gives amorphous thin films or bulk material

Melting Point: Mp 1780°

>>Variant: Titanium sulfide (TiS₂)

CAS Registry Number: 12039-13-3

Molecular Formula: S₂Ti

Molecular Weight: 112.012

Accurate Mass: 111.892087

Percentage Composition: S 57.25%; Ti 42.75%

Source/Synthesis: Synth. by a variety of sulfidation reactions e.g. from TiO₂ + CS₂, Ti + S at 500-580°, or TiCl₄ and a variety of org. sulfur compds.

Use/Importance: Commercially available. Important as electrode material for Li-S batteries; also acts as hydrogenation or hydrodesulfurisation catalyst

Melting Point: Mp 1927-1967°

Aldrich: 33349-2

>>Variant: Titanium sulfide (TiS₃)

CAS Registry Number: 12423-80-2

Molecular Formula: S₃Ti

Molecular Weight: 144.078

Accurate Mass: 143.864157

Percentage Composition: S 66.77%; Ti 33.23%

Source/Synthesis: Synth. by heating the elements at 500° in an Au vessel, or from TiCl₄ and a variety of org. sulfur compds.

References:

Murray, J.L., *Bull. Alloy Phase Diagrams*, 1986, **7**, 156; 205, (*phase diag, cryst struct, TiS, TiS₂, TiS₃ and many others*)

Japan. Pat., 1986, 86 127 623; *CA*, **106**, 35540k, (*synth, TiS₃*)

Japan. Pat., 1987, 87 148 324; *CA*, **108**, 8806m, (*synth, TiS₂, TiS₃*)

Bochmann, M. *et al.*, *Chem. Comm.*, 1988, 344, (*synth, TiS*)

Bensalem, A. *et al.*, *Mater. Res. Bull.*, 1988, **23**, 857, (*synth, TiS₂, TiS₃, Ti₃S₄*)

Lacroix, M. *et al.*, *J. Catal.*, 1989, **120**, 473, (*catalyst, TiS₂*)

Huang, C.K. *et al.*, *Proc. Electrochem. Soc.*, 1990, **90**, 42, (*non-stoichiometric TiS₂ in Li batteries*)

Furuset, A. *et al.*, *Acta Chem. Scand.*, 1991, **45**, 694, (*cryst struct, TiS₃*)

Eur. Pat., 1991, 440 516; *CA*, **115**, 186357t, (*synth, TiS₂*)