



>>Entry Name: Iron silicides

Related CAS Registry Numbers(s): 12023-77-7

Molecular Formula: [FeSi]

>>Variant: Iron silicide (Fe₃Si)

CAS Registry Number: 12023-54-0

Molecular Formula: Fe₃Si

Molecular Weight: 195.627

Accurate Mass: 195.781744

Percentage Composition: Fe 85.64%; Si 14.36%

Use/Importance: Refractory. Used to coat steel for increased heat resistance. Component of magnetic tapes and disks to increase thermal stability. Methanation catalyst

>>Variant: Iron silicide (FeSi)

Synonym(s): Fersilicite

CAS Registry Number: 12022-95-6

Molecular Formula: FeSi

Molecular Weight: 83.933

Accurate Mass: 83.911866

Percentage Composition: Fe 66.54%; Si 33.46%

Source/Synthesis: Mineral from USSR

Use/Importance: Component in hard ceramic composites. Methanation catalyst

Physical Description: Yellow-grey metallic opaque solid

Melting Point: Mp 1405-1410°

Solubility: Insol. H₂O

Other Data: Paramagnetic at high temps., antiferromagnetic below 400K

>>Variant: Iron silicide (FeSi₂)

Synonym(s): Ferdisilicite

CAS Registry Number: 12022-99-0

Molecular Formula: FeSi₂

Molecular Weight: 112.018

Accurate Mass: 111.888793

Percentage Composition: Fe 49.86%; Si 50.14%

Source/Synthesis: Mineral from USSR

Use/Importance: Used in deoxidising agents for welding flux; in humidity sensors; FeSi₂ thermocouples; in thermoelectric solar cells. Catalyses oxidation of hydrogen. Methanation catalyst

Physical Description: Steel grey metallic opaque solid

Other Data: Reacts with EtOH in pres. of EtONa to give Si(OEt)₄

Aldrich: 39958-2

References:

Pauling, L. *et al.*, *Acta Cryst.*, 1948, **1**, 212, (*struct, FeSi*)

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Imamura, H. *et al.*, *J. Phys. Chem.*, 1979, **83**, 2009, (*catalysis, use*)

Aggarwal, K. *et al.*, *Phys. Status Solidi A*, 1979, **53**, K95, (*Mössbauer, FeSi₂*)

Edwards, D.M., *J. Phys. (Paris)*, 1982, **12**, 1789, (*magnetism, FeSi*)

Egert, B. *et al.*, *Phys. Rev. B*, 1984, **29**, 2091, (*pe, bonding*)

Weaver, J.H. *et al.*, *Phys. Rev. B: Condens. Matter*, 1984, **29**, 3293, (*bonding, FeSi₂*)

Raghavan, V., *J. Alloy Phase Diagrams*, 1986, **2**, 97, (*struct, FeSi₂, FeSi*)

Van der Kraan, A.M. *et al.*, *Physica B+C (Amsterdam)*, 1986, **138**, 55, (*Mössbauer*)

Eur. Pat., 1988, 266 105; *CA*, **109**, 10722v, (*manuf, Fe₃Si*)

Tegze, M., *Z. Phys. Chem. (Munich)*, 1988, **157**, 509, (*electronic struct, Fe₃Si*)