



>>Entry Name: Nickel sulfides

CAS Registry Number: 11113-75-0

Molecular Formula: [NiS]

Aldrich: 34322-6

>>Variant: Nickel sulfide (Ni<sub>3</sub>S<sub>2</sub>)

Synonym(s): Nickel sesquisulfide. Nickel subsulfide. Trinickel disulfide

CAS Registry Number: 12035-72-2

Molecular Formula: Ni<sub>3</sub>S<sub>2</sub>

Molecular Weight: 240.202

Accurate Mass: 237.750178

Percentage Composition: Ni 73.30%; S 26.70%

interconnected by short Ni-S and Ni-Ni distances

Source/Synthesis: Synth. from Nickel(II) sulfate (NiSO<sub>4</sub>) JCC03-T + H<sub>2</sub>S + H<sub>2</sub>. Microcryst. samples synth. by reduction of NiSO<sub>4</sub> with H<sub>2</sub> at 500° for 2h. Single cryst. produced by vapour transport technique using microcryst. material

Use/Importance: Good metallic conductor over range from 4.5-300K

Physical Description: Light bronze solid or brass-yellow prismatic cryst.

Melting Point: Mp 800°

Other Data: Pauli paramagnetic. Structure is low temp. form. Stable up to 570°. At higher temps, cubic phase formed. Resistivity  $\rho = 1.8 \times 10^{-5} \Omega \text{ cm}$ . Behaves as a Pauli paramagnetic

>>Derivative: Mineral-form

Synonym(s): Heazlewoodite

CAS Registry Number: 12035-71-1

Source/Synthesis: Found as in Canada, Tasmania, USSR and elsewhere

Other Data: Prob. identical to synthetic material

>>Variant: Nickel sulfide (NiS)

CAS Registry Number: 16812-54-7

Molecular Formula: NiS

Molecular Weight: 90.756

Accurate Mass: 89.907416

Percentage Composition: Ni 64.67%; S 35.33%

>>Derivative:  $\alpha$ -form

Physical Description: Amorphous

Other Data: Unstable in air

>>Derivative:  $\beta$ -form

Source/Synthesis: Synth. from Hexaaquanickel(II)(2+) JWL44-J + S<sup>2(-)</sup>

Physical Description: Black solid

Solubility: Insol. H<sub>2</sub>O, sol. HNO<sub>3</sub> aqua regia, S<sup>2(-)</sup> aq.

Other Data: Most stable form with NiAs struct. Antiferromagnetic

>>Derivative:  $\gamma$ -form

Synonym(s): Millerite

CAS Registry Number: 1314-04-1

Source/Synthesis: Occurs widely as low temp. mineral in limestone

Physical Description: Brass-yellow cryst., tarnishes greenish grey

Other Data: Contains 5-coordinate Ni. Antiferromagnetic