



>>>Variant: Molybdenum sulfide (Mo₂S₅)

CAS Registry Number: 12033-34-0

Molecular Formula: Mo₂S₅

Molecular Weight: 352.21

Accurate Mass: 355.671162

Percentage Composition: Mo 54.48%; S 45.52%

Source/Synthesis: Synth. by Zn redn. of 20% H₂SO₄ soln. of ammonium molybdate followed by addition of H₂S

Physical Description: Dark red cryst. + 3H₂O or black solid

Other Data: Loses 1H₂O at 135-140°. Also forms 1.5-sulfohydrate

>>>Variant: Molybdenum sulfide (MoS₃)

Synonym(s): Molybdenum trisulfide

CAS Registry Number: 12033-29-3

Molecular Formula: MoS₃

Molecular Weight: 192.138

Accurate Mass: 193.821616

Percentage Composition: Mo 49.93%; S 50.07%

Source/Synthesis: Synth. by thermal dec. of a tetrathiomolybdate e.g. (NH₄)₂MoS₄ in an inert atm.

Use/Importance: Battery material

Physical Description: Shiny black solid

Solubility: Insol. H₂O, org. solvs.

Other Data: Dec. at about 350° in inert atm. to MoS₂. Oxidises in air above about 200°, giving MoO₃

²⁽⁻⁾_{1/2}

>>>Variant: Molybdenum sulfide (MoS₄)

CAS Registry Number: 12136-77-5

Molecular Formula: MoS₄

Molecular Weight: 224.204

Accurate Mass: 225.793686

Percentage Composition: Mo 42.79%; S 57.21%

tetragonal antiprismatic coord. of Mo atoms by disulfide pairs S₂, as in Patronite (V(S₂)₂) [HWQ84-Y](#)

Source/Synthesis: Synth. from potassium paramolybdate and H₂S, or by thermal dissociation of (NH₄)₂ MoS₁₂·2(H₂O) in vacuum at 300-320°; Li intercalates, Li_xMoS₄ synth. from MoS₄ + *n*-BuLi at r.t.

Use/Importance: Li intercalates have potential applications as cathodic materials in rechargeable batteries with high energy capacities

Physical Description: Dark red translucent powder when freshly prepd., hygroscopic grey powder on drying

References:

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