



>>Entry Name: Molybdenum nitrides

CAS Registry Number: 37245-81-1

Related CAS Registry Numbers(s): 11032-99-8 12274-11-2 39350-93-1 60862-49-9 72256-02-1 97953-19-0 107478-08-0 113958-23-9 113958-24-0 114176-86-2 118032-97-6 118032-98-7 118033-00-4 118146-94-4 123172-25-8 128764-74-9 131162-36-2

Molecular Formula: [MoN]

>>Variant: Molybdenum nitride (Mo₁₆N₇)

CAS Registry Number: 12509-07-8

Molecular Formula: Mo₁₆N₇

Molecular Weight: 1633.087

Accurate Mass: 1664.508014

Percentage Composition: Mo 94.00%; N 6.00%

Source/Synthesis: Synth. from CaN and Mo heated to 450° for 1 day and 750° for 2 weeks

>>Variant: Molybdenum nitride (Mo₂N)

CAS Registry Number: 12033-31-7

Molecular Formula: Mo₂N

Molecular Weight: 205.887

Accurate Mass: 209.813886

Percentage Composition: Mo 93.20%; N 6.80%

Source/Synthesis: Synth. by heating Mo in an NH₃ atm. at *ca.* 1100°

Use/Importance: Component of refractory alloys and special steels

Physical Description: Grey solid. Chemically inert except towards oxidising agents. Hard; high electrical conductivity which decreases with temp. Superconductor below 5K

Other Data: Dissoc. at 895° to elements

>>Variant: Molybdenum nitride

CAS Registry Number: 11137-94-3

Molecular Formula: Mo₃N₂

Molecular Weight: 315.833

Accurate Mass: 321.722366

Percentage Composition: Mo 91.13%; N 8.87%

Source/Synthesis: Synth. from MoO₃ + H₂ + NH₃ at 700°

>>Variant: Molybdenum nitride (MoN)

CAS Registry Number: 12033-19-1

Molecular Formula: MoN

Molecular Weight: 109.947

Accurate Mass: 111.90848

Percentage Composition: Mo 87.26%; N 12.74%

Source/Synthesis: Obt. by heating Mo in an atm. of NH₃ or N₂ and H₂ at about 1100°

Use/Importance: Component of refractory alloys and special steels

Physical Description: Chemically inert, except towards oxidising agents. Hard, high electrical conductivity decreasing with temp., exhibits superconductivity below 12K

Solubility: Insol. H₂O

References:

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Mathis, M., *Bull. Soc. Chim. Fr.*, 1951, 443, (*Mo₃N₂*)

Storms, E.K., *A Critical Review of Refractories*, Los Alamos Scientific Laboratories, 1964, LA-2942, (*rev*)

Karam, R. *et al.*, *Inorg. Chem.*, 1970, **9**, 1385, (*synth, Mo₁₆N₇*)

Ettmayer, P., *Monatsh. Chem.*, 1970, **101**, 127, (*synth, struct, γ,β,Mo₂N*)

Jack, D.H. *et al.*, *Mater. Sci. Eng.*, 1973, **11**, 1, (*use, rev*)

Bates, J.K. *et al.*, *J. Mol. Spectrosc.*, 1979, **78**, 284, (*absorption spectra MoN*)

Knight, L.B. *et al.*, *J. Chem. Phys.*, 1982, **76**, 3378, (*epr, MoN*)

Wells, A.F., *Structural Inorg. Chem.*, 3rd Ed., O.U.P., 1984, 1051; 1321, (*struct*)

Jung, J. *et al.*, *Physica B+C (Amsterdam)*, 1986, **139-140**, 639, (*synth, MoN*)