



>>Entry Name: Tantalum nitrides

CAS Registry Number: 59114-58-8

Molecular Formula: [NTa]

Use/Importance: Used in semi-conductor devices, ceramics and as a coating on cutting tools

>>Variant: Tantalum nitride (Ta₂N), 11Cl

CAS Registry Number: 12033-63-5

Molecular Formula: NTa₂

Molecular Weight: 375.903

Accurate Mass: 375.899058

Percentage Composition: N 3.73%; Ta 96.27%

Source/Synthesis: Synth. by heating Ta in N₂ above 790° or by heating Ta in NH₃ at high temps.

>>Variant: Tantalum nitride (TaN), 11Cl

CAS Registry Number: 12033-62-4

Molecular Formula: NTa

Molecular Weight: 194.955

Accurate Mass: 194.951066

Percentage Composition: N 7.18%; Ta 92.82%

Source/Synthesis: Synth. by heating Ta in an Ar/N₂ plasma or by zone melting Ta in an N₂ atm.

Aldrich: 33320-4

>>Variant: Tantalum nitride (Ta₅N₆), 11Cl

Source/Synthesis: Synth. by heating Ta₃N₅ to 950° in Ar or NH₃ or Ta + N₂ at 1200°/300 atm.

>>Variant: Tantalum nitride (Ta₄N₅), 11Cl

CAS Registry Number: 12339-86-5

Molecular Formula: N₅Ta₄

Molecular Weight: 793.825

Accurate Mass: 793.807338

Percentage Composition: N 8.82%; Ta 91.18%

Source/Synthesis: Synth. by heating Ta₃N₅ to 900° in Ar or NH₃

>>Variant: Tantalum nitride (Ta₃N₅), 11Cl

CAS Registry Number: 12033-94-2

Molecular Formula: N₅Ta₃

Molecular Weight: 612.877

Accurate Mass: 612.859346

Percentage Composition: N 11.43%; Ta 88.57%

Source/Synthesis: Synth. by heating Ta₂O₅, KCl and NH₃ to 790°

Physical Description: Bright red solid

References:

- Brauer, J. *et al.*, *Z. Anorg. Allg. Chem.*, 1966, **348**, 298, (*synth, Ta₃N₅*)
Fontbonne, A. *et al.*, *Rev. Int. Hautes Temp. Refract.*, 1969, **6**, 181, (*synth, struct, Ta₄N₅, Ta₅N₆*)
Terao, N., *Jpn. J. Appl. Phys.*, 1971, **10**, 248, (*struct, ed, Ta₂N*)
Brauer, G. *et al.*, *Monatsh. Chem.*, 1971, **102**, 1311, (*synth, Ta₂N*)
Geels, R.H. *et al.*, *Metall. Trans.*, 1973, **4**, 1469, (*synth, cryst struct, Ta₂N*)
Strachle, J., *Z. Anorg. Allg. Chem.*, 1973, **402**, 47, (*cryst struct, Ta₃N₅*)
Conroy, L.E. *et al.*, *J. Solid State Chem.*, 1977, **20**, 205, (*synth, cryst struct, TaN*)
Christensen, A.N. *et al.*, *Acta Cryst. B*, 1978, **34**, 261, (*cryst struct, TaN*)
Vendl, A., *Monatsh. Chem.*, 1978, **109**, 1009, (*synth, Ta₅N₆*)
Ronsheim, P. *et al.*, *Plasma Chem. Plasma Process.*, 1981, **1**, 135, (*synth, TaN*)
Wittmer, M., *Proc. Electrochem. Soc.*, 1986, **86-2**, 4, (*rev, uses*)