



>>Entry Name: Hafnium nitrides

CAS Registry Number: 11115-87-0

Molecular Formula: [HfN]

General Statement: Rather few phases are known: of these HfN is by far the most studied

>>Variant: Hafnium nitride (Hf₄N₃), 11Cl

CAS Registry Number: 12508-71-3

Molecular Formula: Hf₄N₃

Molecular Weight: 755.98

Accurate Mass: 761.795402

Percentage Composition: Hf 94.44%; N 5.56%

General Statement: Formed by filling octahedral interstices in the (111) planes of Hf

Source/Synthesis: Synth. by heating Hf and HfN at the Mp of Hf

>>Variant: Hafnium nitride (HfN), 11Cl

CAS Registry Number: 25817-87-2

Molecular Formula: HfN

Molecular Weight: 192.497

Accurate Mass: 193.949619

Percentage Composition: Hf 92.72%; N 7.28%

General Statement: Interstitial nitride, NaCl struct.

Source/Synthesis: Synth. by vapour phase transport of HfCl₄/N₂/H₂, 1000-1450° or by reaction of Hf with NaN₃ in a rapid, self-sustaining reaction

Use/Importance: Used in ceramics for cutting tools

Physical Description: Gold coloured, good conductor

Melting Point: Mp 3330°

Aldrich: 39956-6

>>Variant: Hafnium nitride (Hf₃N₄)

CAS Registry Number: 104382-33-4

Molecular Formula: Hf₃N₄

Molecular Weight: 591.497

Accurate Mass: 595.851931

Percentage Composition: Hf 90.53%; N 9.47%

General Statement: Struct. similar to HfN but with vacancies in the metal sub-lattice

Source/Synthesis: Synth. from HfCl₄ and NH₃ above 900° or by dual ion-beam deposition

Physical Description: Straw-coloured insulator

References:

Kieffer, R. *et al.*, *Plansee Semin.*, 8th, 1974, **2**, 36, (rev, HfN)

Holt, J.B. *et al.*, *Ind. Res. Dev.*, 1983, **25**, 88; *Mater. Sci. Res.*, 1984, **17**, 167, (synth, HfN)

Futamoto, M. *et al.*, *J. Cryst. Growth*, 1983, **61**, 69, (synth, HfN)

Demyashev, C.M. *et al.*, *J. Less-Common Met.*, 1985, **107**, 59, (synth, cryst struct, Hf₄N₃)

Johansson, B.O. *et al.*, *J. Mater. Res.*, 1986, **1**, 442, (synth, cryst struct, Hf₃N₄)

Yajima, A., *Nippon Kagaku Kaishi*, 1986, 1175; *CA*, **105**, 211168k, (synth, Hf₃N₄)

Wittmer, M., *Proc. Electrochem. Soc.*, 1986, **86-2**, 4, (rev, props, uses, HfN)