



>>Entry Name: Iron nitrides

Molecular Formula: [FeN]

>>Variant: Iron nitride (Fe₁₀N)

Synonym(s): γ-phase

Molecular Formula: Fe₁₀N

Molecular Weight: 572.477

Accurate Mass: 573.352464

Percentage Composition: Fe 97.55%; N 2.45%

Other Data: Stable >600°

>>Variant: Iron nitride (Fe₈N)

Synonym(s): α"-phase

CAS Registry Number: 12023-85-7

Extra CAS Registry Numbers(s): 12063-72-8

Molecular Formula: Fe₈N

Molecular Weight: 460.783

Accurate Mass: 461.482586

Percentage Composition: Fe 96.96%; N 3.04%

Use/Importance: Used in magnetic recording materials, nitriding process of steel

Other Data: Observed to form after ageing of steel surface subjected to nitriding process

>>Variant: Iron nitride (Fe₄N)

Synonym(s): γ'-phase

CAS Registry Number: 12023-64-2

Molecular Formula: Fe₄N

Molecular Weight: 237.395

Accurate Mass: 237.74283

Percentage Composition: Fe 94.10%; N 5.90%

Source/Synthesis: Produced by heating Fe₂N to 600° *in vacuo*

Use/Importance: Used in case hardening of steel; magnetic recording tapes

Other Data: Dec. at *ca.* 640° with loss of N₂. Ferromagnetic; Curie point 763K

>>Variant: Iron nitride (Fe₃N)

Synonym(s): ε-phase

CAS Registry Number: 12023-51-7

Molecular Formula: Fe₃N

Molecular Weight: 181.548

Accurate Mass: 181.807891

Percentage Composition: Fe 92.28%; N 7.72%

Use/Importance: Used in case hardening of steel. Magnetic recording tapes

Other Data: Stable to 420°. Ferromagnetic; Curie point 567K

>>Variant: Iron nitride (Fe₂N)

CAS Registry Number: 12023-20-0

Molecular Formula: Fe₂N

Molecular Weight: 125.701

Accurate Mass: 125.872952

Percentage Composition: Fe 88.86%; N 11.14%

Use/Importance: Used in case hardening of steel; magnetic recording tapes

Physical Description: Grey solid

Melting Point: Mp 200 dec.°

Solubility: Insol. H₂O; sol. HCl, H₂SO₄

Other Data: Dec. at 400° to Fe₄N with loss of N₂

References: