



>>Entry Name: Chromium nitrides

Related CAS Registry Numbers(s): 12053-46-2 12645-10-2 12645-11-3 28042-66-2 58815-27-3 58815-28-4 58815-29-5 58815-30-8

Molecular Formula: [CrN]

Other Data: Other phases Cr₃N, Cr₃N₂, Cr₄N also known

>>Variant: Chromium nitride (Cr₂N)

Synonym(s): Dichromium nitride

CAS Registry Number: 12053-27-9

Molecular Formula: Cr₂N

Molecular Weight: 117.999

Accurate Mass: 117.884092

Percentage Composition: Cr 88.13%; N 11.87%

General Statement: Struct. consists of hcp Cr with N in octahedral interstices. Non stoichiometric: stable between CrN_{0.38}-CrN_{0.5}

Source/Synthesis: Obt. by nitridation of Cr in NH₃; or by heating Cr in N₂ atm. at 1200°

Use/Importance: Used in wear-resistant coatings

Physical Description: V. hard silvery solid or cryst.

Melting Point: Mp 1650°

Solubility: Sol. HCl

Other Data: Also reported to dec. at =1500° without melting

Aldrich: 40267-2

>>Variant: Chromium nitride (CrN)

CAS Registry Number: 24094-93-7

Molecular Formula: CrN

Molecular Weight: 66.003

Accurate Mass: 65.943583

Percentage Composition: Cr 78.78%; N 21.22%

General Statement: Paramagnetic with NaCl struct. at r.t. Antiferromagnetic with orthorhombic struct. ≤ 0°

Source/Synthesis: Synth. from Cr + N₂ at 400 atm. and 1000° for 140hr

Use/Importance: Catalyst, used in wear-resistant coatings

Physical Description: Dark grey powder; bronze yellow cryst. with metallic lustre

Solubility: Sol. conc. HCl

Other Data: Dissoc. at 1500° without melting. $\mu_{\text{eff}} = 2.41\mu_{\text{B}}$ (77K)

>>Variant: Chromium nitride (CrN₂)

Synonym(s): Chromium-dinitrogen complex

CAS Registry Number: 32376-71-9

Molecular Formula: CrN₂

Molecular Weight: 80.01

Accurate Mass: 79.946657

Percentage Composition: Cr 64.99%; N 35.01%

General Statement: One of a series of Cr(N₂)_n (n = 1-6) compds. identified spectroscopically

Source/Synthesis: Synth. by cocondensation of Cr and N₂ at 10K

Other Data: Ir $\nu_{\text{N}2}$ 2215, 2142 cm⁻¹

References:

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Mills, T., *J. Less-Common Met.*, 1970, **22**, 373, (CrN system)
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Srivastava, R.D. *et al.*, *High Temp. Sci.*, 1973, **5**, 489, (ms)
Brauer, G., *Handbuch Prap. Anorg. Chem.*, 3rd edn., Ferdinand Enke Verlag, 1975, **3**, 1493, (synth)
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