



>> **Name:** Ammonia, 11Cl
Synonym(s): Azane. Ammine. Amine

CAS Registry Number: 7664-41-7
Related CAS Registry Numbers(s): 13587-49-0 13767-16-3 19496-55-0 34819-78-8
NH₃ (C_{3v})

Molecular Formula: H₃N
Molecular Weight: 17.03
Accurate Mass: 17.026549
Percentage Composition: H 17.75%; N 82.25%

Source/Synthesis: Synth. from N₂ + H₂. Manuf. via Haber Process
Use/Importance: Commercially available as anhyd. gas and aq. soln. Extensively used in fertiliser industry; in manuf. of HNO₃, explosives, synthetic fibres; in chemical industry. Self-ionising non-aqueous solvent: 2NH₃ <<>> NH₄⁽⁺⁾ + NH₂⁽⁻⁾; K_{-50°} = 10⁻³⁰. Important industrial chemical, USA production in 1999 18.99 million tons
Physical Description: Colourless alkaline nonflammable gas with v. pungent odour
Melting Point: Mp -77.8°
Boiling Point: Bp -33.5°
Solubility: V. sol. H₂O, CHCl₃, Et₂O
pKa Value: pK_a 9.25 (25°)
Other Data: T_{crit} 133.0; P_{crit} 111.5 atm.
Hazard & Toxicity: Corrosive, toxic, irritant

Aldrich: 39268-5

>>**Derivative:** Trideutero compd.
Synonym(s): Ammonia-d₃. Perdeuteroammonia

CAS Registry Number: 13550-49-7
Molecular Formula: D₃N
Molecular Weight: 20.049
Source/Synthesis: Synth. from Mg₃N₂ + D₂O
Use/Importance: Commercially available
Physical Description: Colourless gas, similar to NH₃
Melting Point: Mp -73.6°
Boiling Point: Bp -31.1°
pKa Value: pK_a 9.76 (20°)
Other Data: T_{crit} 132.3°
Aldrich: 42297-5
Fluka: 9704
Sigma: A5266

>>**Derivative:** Hydrate

References:

Aldrich Library of FT-IR Spectra: Vapor Phase, 1989, **3**, 363A, (ir)
Mellor Compr. Treat. Inorg. Theor. Chem., 1928, **8**, 144; 1964, **8/I/1**, 240, (rev)
Helminger, P. *et al.*, *J. Mol. Spectrosc.*, 1971, **39**, 94, (struct)
Fieser and Fieser's Reagents for Organic Synthesis, Wiley, 1975, **5**, 15, (use)
Brauer, G., *Handbuch Prap. Anorg. Chem.*, 3rd edn., Ferdinand Enke Verlag, 1975, **1**, 152; 445, (synth ND₃, NH₃)
Kirk-Othmer Encycl. Chem. Technol., 3rd edn., Wiley, 1978, **2**, 470, (rev)
Urban, S. *et al.*, *J. Mol. Spectrosc.*, 1984, **106**, 29, (ND₃, ir, microwave)
Lewis, R.J., *Sax's Dangerous Properties of Industrial Materials*, 8th edn., Van Nostrand Reinhold, 1992, AMY500