



>>Entry Name: Aluminium nitride (AlN)

CAS Registry Number: 24304-00-5

AlN

Molecular Formula: AlN

Molecular Weight: 40.988

Accurate Mass: 40.984613

Percentage Composition: Al 65.83%; N 34.17%

Source/Synthesis: Synth. from Al and N₂ or Al₂O₃, C and N₂ at 1400-1500°; from R₃AlNH₃ or Cl₃AlNH₃ at 1200°; obt. by chemical vapour deposition methods. High purity materials synth. from organometallic or polymeric precursors by either a pyrolysis or carbothermal reduction process

Use/Importance: Used in high power integrated circuits and acoustic devices. Refractory. Hard. Commercially available

Physical Description: White air stable prismatic needles. Stable in acid. Slow dec. in hot conc. alkali

Melting Point: Mp 2400°

Other Data: E_g 6.2 eV. Electrical cond. $10^{-12} \Omega^{-1} \text{ m}^{-1}$. Thermal cond. $320 \text{ W m}^{-1} \text{ K}^{-1}$. Relative permittivity ϵ 4.8. $\Delta H_{f298}^\circ -318 \text{ kJ mol}^{-1}$; $S_{298}^\circ 20.1 \text{ J K}^{-1} \text{ mol}^{-1}$

Aldrich: 24190-3

References:

- Jeffrey, G.A. *et al.*, *J. Chem. Phys.*, 1956, **25**, 1024, (*cryst struct*)
Renner, T., *Z. Anorg. Allg. Chem.*, 1959, **298**, 22, (*synth, props*)
Taylor, K.M. *et al.*, *J. Electrochem. Soc.*, 1960, **107**, 308, (*synth, props*)
Compound Semiconductors, Willardson, R.K., *et al*, Reinhold, 1962, (*synth*)
Van Vechten, J.A., *Phys. Rev.*, 1969, **182**, 891, (*props*)
McGuire, G.E. *et al.*, *Inorg. Chem.*, 1973, **12**, 2450, (*pe*)
O'Keefe, M. *et al.*, *Acta Cryst. B*, 1978, **34**, 3519, (*cryst struct*)
Kuramoto, N. *et al.*, *J. Mater. Sci. Lett.*, 1984, **3**, 471, (*props, use*)
Fister, D., *Ceram. Eng. Sci. Proc.*, 1985, 1305, (*use*)
Kurokawa, Y. *et al.*, *J. Am. Ceram. Soc.*, 1988, **71**, 588, (*synth, props*)
Marchant, D.D. *et al.*, *Adv. Ceram.*, 1989, **26**, 19, (*rev*)
Kuramoto, N. *et al.*, *Am. Ceram. Soc. Bull.*, 1989, **68**, 883, (*props, use*)
Kubota, K. *et al.*, *J. Appl. Phys.*, 1989, **66**, 2964, (*props*)
Rockensüss, W. *et al.*, *Adv. Mater.*, 1993, **5**, 443, (*synth*)
Baixia, L. *et al.*, *J. Mater. Chem.*, 1993, **3**, 117, (*high purity, rev, synth*)