>>**Entry Name: Aluminium(*III*) hydride (AlH_3)**
Synonym(s): Alane

CAS Registry Number: 7784-21-6
AlH_3

Molecular Formula: AlH_3
Molecular Weight: 30.005
Accurate Mass: 30.005014
Percentage Composition: Al 89.92%; H 10.08%
General Statement: Solid state struct. comprises 3-D network of Al-H-Al with Al octahedrally coord.
Source/Synthesis: Synth. from $LiAlH_4$ and $AlCl_3$ in Et_2O or $LiAlH_4$ and H_2SO_4 in THF
Use/Importance: Commercially available
Physical Description: Air- and moisture-sensitive white amorph. or microcryst. solid
Solubility: Sol. Et_2O, THF
Other Data: Usually made in THF or Et_2O and used *in situ*. Several solid forms descr. Solids $AlH_3.nEt_2O$ (n = 0.3 - 3) obt. from Et_2O

>>**Derivative:** Me_3N complex (1:1)
Synonym(s): (*N,N*-Dimethylmethanamine)trihydroaluminium, 9CI. Trihydro(trimethylamine)aluminium. Aluminium hydride trimethylamine. Trimethylamine-alane

CAS Registry Number: 16842-00-5
Molecular Formula: $C_3H_{12}AlN$
Molecular Weight: 89.116
Accurate Mass: 89.078513
Percentage Composition: C 40.43%; H 13.57%; Al 30.28%; N 15.72%
Source/Synthesis: Synth. from $LiAlH_4$ and $[Me_3NH]Cl$
Physical Description: V. air- and moisture-sensitive white solid
Melting Point: Mp 76°
Aldrich: 45579-2

>>**Derivative:** Me_3N complex (1:2)
Synonym(s): *N,N*-Dimethylmethanamine, compd. with aluminium hydride (AlH_3) (2:1), 9CI. Trihydrobis(trimethylamine)aluminium. Aluminium hydride bis(trimethylamine). Bis(trimethylamine)alane. Trimethylamine-alane (2:1)

CAS Registry Number: 17211-58-4
Extra CAS Registry Numbers(s): 50981-97-0
Molecular Formula: $C_6H_{21}AlN_2$
Molecular Weight: 148.227
Accurate Mass: 148.152012
Percentage Composition: C 48.62%; H 14.28%; Al 18.20%; N 18.90%
Source/Synthesis: Synth. from $Me_3N.AlH_3$ + Me_3N
Use/Importance: Commercially available. Solid precursor for laser chemical vapour deposition of high purity Al (<5% impurities). High deposition rates can be achieved. Low resistivity of deposits (6.5 μΩcm). Can be used for direct writing of Al lines for IC rewiring applications on GaAs. Precursor to AlN for use in MOCVD processes in an NH_3 atmosphere
Physical Description: White cryst.
Melting Point: Mp 95°
Other Data: Trigonal pyramidal at Al. Dec. into 1:1 complex >0°
Aldrich: 47065-1

>>**Derivative:** Me_3N complex (2:2)

CAS Registry Number: 145425-34-9
Molecular Formula: $C_6H_{24}Al_2N_2$
Molecular Weight: 178.232
Accurate Mass: 178.157026
Percentage Composition: C 40.43%; H 13.57%; Al 30.28%; N 15.72%
Source/Synthesis: Synth. from $LiAlH_4$ and $[Me_3NH]Cl$
Physical Description: V. air- and moisture-sensitive white solid
Melting Point: Mp 76°