



>>Entry Name: Aluminium(III) chloride (AlCl₃)

Synonym(s): Aluminium trichloride. Aluminium chloride, USAN

CAS Registry Number: 7446-70-0

Extra CAS Registry Numbers(s): 13845-12-0

AlCl₃

Molecular Formula: AlCl₃

Molecular Weight: 133.34

Accurate Mass: 131.888095

Percentage Composition: Al 20.24%; Cl 79.76%

General Statement: Distorted CrCl₃ struct. in solid state; dimeric in soln. and liq.; monomer, dimer and some trimer in vapour

Source/Synthesis: Synth. from Al and Cl₂, or from Al and HCl at 500°

Use/Importance: Lewis acid. Friedel Crafts catalyst. Intermed. in one process for manuf. of Al. Commercially available

Physical Description: V. moisture-sensitive colourless hexagonal plates

Melting Point: Mp 192° (2.5 atm)

Boiling Point: Subl. 180°

Other Data: $\Delta H_f^\circ(s)$ -705.8 kJ mol⁻¹; S° 109.2 J K⁻¹ mol⁻¹. Many complexes descr.

Hazard & Toxicity: Reacts violently with H₂O. Forms explosive mixt. with PhNO₂ in the presence of an oxidisable org. compd., e.g. diphenylacetylene, phenol

Aldrich: 29471-3

Fluka: 6230

Sigma: A7178

>>Derivative: Hydrate

Synonym(s): Aluminium chloride hydrate

CAS Registry Number: 10124-27-3

Use/Importance: Commercially available

Other Data: A mixt. of hydrated species AlCl₃.x H₂O

Aldrich: 22939-3

>>Derivative: Hexahydrate

Synonym(s): Hexaaquaaluminium(3+) chloride

CAS Registry Number: 7784-13-6

Molecular Formula: AlCl₃H₁₂O₆

Molecular Weight: 241.431

Accurate Mass: 239.951485

Percentage Composition: Al 11.18%; Cl 44.05%; H 5.01%; O 39.76%

Use/Importance: Salting agent in soap industry; component of deodorant preps., wood preservative; in photofixing baths

Physical Description: Colourless cryst. (H₂O)

Melting Point: Mp 100 dec.°

Aldrich: 23707-8

Fluka: 6232

Sigma: A3017

>>Derivative: NH₃ complex

see Amminetrichloroaluminium, [JFR96-P](#)

>>Derivative: NH₃ complex (2:6)

Synonym(s): Tetraamminedichloroaluminium(1+) diamminetetrachloroaluminate(1-)

CAS Registry Number: 147998-63-8

Molecular Formula: Al₂Cl₆H₁₈N₆

Molecular Weight: 368.862

Accurate Mass: 365.935484

Percentage Composition: Al 14.63%; Cl 57.67%; H 4.92%; N 22.78%

Source/Synthesis: Synth. from [102694-1](#) and NH₃ (1:2) at 200°

Physical Description: Air- and moisture-sensitive colourless cryst.

Other Data: Contains octahedral [AlCl₂(NH₃)₄]⁽⁺⁾ and [AlCl₄(NH₃)₂]⁽⁻⁾ ions. Sublimes