






Aluminium and its compounds

including Aluminium oxide, hydroxide, sulfate(VI), chloride; also Potash alum

Substance	Hazard	Comment
Aluminium (metal) Solid (<i>large pieces, sheets, etc</i>)	LOW HAZARD	Used in cooking utensils and generally considered safe. Suggestions at one time it might cause Alzheimer's disease, now considered unlikely.
Aluminium (metal) Fine powder	 FLAMMABLE	DANGER: flammable solid; in contact with water releases flammable gas (hydrogen, see <i>CLEAPSS Student Safety Sheet 50</i>). A dust explosion is possible if it is exposed to flame. Although difficult to ignite, it is difficult to extinguish. Used as a food additive, E173.
Aluminium oxide (alumina), or aluminium hydroxide	LOW HAZARD	Used in indigestion tablets.
Aluminium potassium sulfate(VI) (potash alum) Solid or solution	LOW HAZARD	Often used for crystal-growing in schools.
Aluminium sulfate(VI) Hydrated solid and most solutions (<i>if 0.1 M or more</i>)	 CORROSIVE.	DANGER: causes serious eye damage. Solutions are acidic. Used as a mordant in dyeing. Added in small amounts to cloudy water in reservoirs to coagulate clay particles. When large amounts were accidentally added to a reservoir at Camelford in Cornwall, some ill effects were reported.
Aluminium sulfate(VI) Dilute solutions (<i>if less than 0.1 M but 0.03 M or more</i>)	 IRRITANT	WARNING: irritating to eyes.
Aluminium sulfate(VI) Very dil. solns. (<i>less than 0.03M</i>)	LOW HAZARD	Note these solutions are extremely dilute.
Aluminium chloride Anhydrous solid	 CORROSIVE	DANGER: causes severe skin burns and eye damage. Reacts exothermically & violently with water to produce fumes of hydrogen chloride (see <i>Sheet 20</i>). Pressure may build up in closed containers due to absorbed moisture.
Aluminium chloride Hydrated solid or conc. solution (<i>if 0.8 M or more</i>)	 IRRITANT	WARNING: irritating to eyes and skin (if ≥ 0.8 M) and respiratory system (if ≥ 1.5 M). The solution is acidic.
Aluminium chloride Dilute solution (<i>if less than 0.8 M</i>)	LOW HAZARD	In antiperspirants and deodorants, it is mixed with other substances and is not classed as hazardous. However, it may be an IRRITANT to people with sensitive skin.

Typical control measures to reduce risk

- Use the lowest possible concentration; wear eye protection.
- Avoid the use of aluminium powder or anhydrous aluminium chloride if possible.
- Avoid raising dust and keep aluminium powder away from naked flames.

Assessing the risks

- **What are the details of the activity to be undertaken? What are the hazards?**
- **What is the chance of something going wrong?**
eg, solution spurts out of a test tube when heated or a solution decomposes when heated to dryness.
- **How serious would it be if something did go wrong?**
eg, are there hazardous reaction products, eg, hydrogen chloride gas from the action of water on anhydrous aluminium chloride?
- **How can the risk(s) be controlled for this activity?**
eg, can it be done safely? Does the procedure need to be altered? Should goggles or safety spectacles be worn?

Emergency action

- **In the eye** Flood the eye with gently-running tap water for at least 10 minutes. Consult a medic.
- **Swallowed** Do no more than wash out the mouth with water. Do **not** induce vomiting. Consult a medic.
- **Dust breathed in** Remove the casualty to fresh air. Consult a medic. if breathing is difficult.
- **Spilt on the skin or clothing** Remove and rinse contaminated clothing. Wash off the skin with plenty of water.
- **Spilt on floor, bench, etc** Scoop up the solid (take care not to raise dust). Wipe up small solution spills or any traces of solid with a cloth.
- **Fire** Powdered aluminium fires should be extinguished by smothering with clean, dry sand.