






# Aluminium and its compounds

including aluminium oxide, hydroxide, sulfate(VI), chloride; also potash alum

Substance	Hazard	Comment
<b>Aluminium (metal)</b> <i>Solid (large pieces, sheets, etc)</i>	Currently not classified as hazardous	Used in cooking utensils and generally considered safe. Suggestions at one time it might cause Alzheimer's disease, now considered unlikely.
<b>Aluminium (metal)</b> <i>Fine powder</i>	 <b>FLAMMABLE</b>	DANGER: flammable solid; in contact with water releases flammable gas (hydrogen, see <i>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.
<b>Aluminium oxide (alumina) and aluminium hydroxide – Solid</b>	Currently not classified as hazardous	Used in indigestion tablets.
<b>Aluminium potassium sulfate(VI)</b> <i>(potash alum) Solid or solution</i>		Often used for crystal-growing in schools.
<b>Aluminium sulfate(VI)</b> <i>Hydrated solid and most solutions (if 0.1 M or more)</i>	 <b>CORROSIVE</b>	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.
<b>Aluminium sulfate(VI)</b> <i>Dilute solutions (if less than 0.1 M but 0.03 M or more)</i>	 <b>IRRITANT</b>	WARNING: irritating to eyes.
<b>Aluminium sulfate(VI)</b> <i>Very dilute solutions (less than 0.03M)</i>	Currently not classified as hazardous	Note these solutions are extremely dilute.
<b>Aluminium chloride</b> <i>Anhydrous solid</i>	 <b>CORROSIVE</b>	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.
<b>Aluminium chloride</b> <i>Hydrated solid or concentrated solution (if 0.8 M or more)</i>	 <b>IRRITANT</b>	WARNING: irritating to eyes and skin (if $\geq 0.8$ M) and respiratory system (if $\geq 1.5$ M). The solution is acidic.
<b>Aluminium chloride</b> <i>Dilute solution (if less than 0.8 M)</i>	Currently not classified as hazardous	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?  
*eg solution spurts out of a test tube when heated or a solution decomposes when heated to dryness.*
- What is the chance of something going wrong?  
*eg are there hazardous reaction products (eg hydrogen chloride gas from the action of water on anhydrous aluminium chloride)?*
- How serious would it be if something did go wrong?  
*eg can it be done safely? Does the procedure need to be altered? Should goggles or safety spectacles be worn?*

## Emergency action

In all emergency situations, alert the responsible adult immediately. Be aware that actions may include the following:

- In the eye                               Irrigate the eye with gently-running tap water for at least 20 minutes. Call 999/111.
- In the mouth/swallowed           Do no more than rinse and spit with drinking water. Do **not** induce vomiting. Call 999/111.
- Dust breathed in                    Remove the casualty to fresh air. Consult a medic if breathing is difficult.
- Spilt on the skin or clothing       Remove contaminated clothing. Irrigate the affected area with gently-running tap water for at least 20 minutes. Call 999/111 as appropriate. Rinse clothing.
- Spilt on the 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.