

Sponsored by the Royal Australian Chemical Institute (RACI)

It is a requirement that student participants, parents and teachers are provided with relevant information on the physical and chemical properties of the crystal to be grown.

Alum (specifically potash alum) has been chosen as the appropriate crystal to grow in similar competitions interstate and overseas. It combines the favoured characteristics of good clarity, well-defined edges and smooth faces with low toxicity and relative ease of use.

MATERIAL SAFETY DATA SHEET (Modified)

POTASSIUM ALUMINIUM SULFATE

(POTASH ALUM, potassium alum dodecahydrate)

$\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$

Formula weight : 474.38

Summary of ChemWatch Hazard ratings

Health (internal toxicity) : slight (1 out of 5)

Flammability : None (0/5)

Reactivity : None (0/5)

Body contact : slight (1/5)

Chronic exposure : not known

Potential Health Effects

Inhalation – may cause irritation to respiratory tract when dissolved in water.

Ingestion – may cause irritation to gastrointestinal tract – nausea, vomiting symptoms

Skin and eye contact – may cause irritation with symptoms of redness itching and pain

First Aid Measures

If a lot of coughing or breathing is difficult move to fresh air, get oxygen and medical attention

If swallowed give large quantities of water (no vomiting). Get medical attention at once

Wipe excess material of skin flush affected area for 15 minutes. Ensure clothing and shoes are washed or cleaned before reuse. Similarly flush eyes for 15 minutes lifting upper and lower eyelids occasionally.

Not considered to be a fire or explosion hazard.

Accidental Release (Spill) Measures

Cover with sodium bicarbonate or sodium carbonate and mix. Place the mix in a suitable container for disposal.

Handling and Storage

Keep in a tightly closed container, stored in a dry cool ventilated area. Potash alum is stable under ordinary conditions of use and storage

Exposure Controls/Personal Protection

PEL (permissible exposure limit), TLV (threshold limit value) : 2 mg/m^3 (TWA) soluble salts as Al. Local exhaust ventilation is recommended.

In the classroom or home situation, the participant should best wear protective clothing such as a lab coat or apron and gloves. Protective eye wear should be considered

Physical Properties

Colourless crystals, odourless, density = 1.73, melting point = 92.5°C

Alum dissolves 14 g per 100 mL in cold water and over 300 g per 100 mL in boiling water. The rapid increase in solubility is an important factor in the growing process. 0.2 M solution has pH of 3.3 (weak acid)

Chemical Properties

Chemically potash alum is unreactive unless heated to decomposition. It can be corrosive to metals in the presence of water. Hence metals and moisture need to be avoided in the storage situation.

No evidence of carcinogenicity. No information found on environmental effects.

Disposal of this compound (that which cannot be saved for recovery or recycling) to an approved waste disposal facility.

In Australia this compound is NOT allocated a Hazchem code or a Poison (S) schedule as it is not considered an intrinsically hazardous substance.

Approved containers should carry the following warning : Harmful if swallowed or inhaled. Causes irritation to skin, eyes and respiratory tract.

Label

Precautions and First Aid Procedures should also appear on the label

Contacts

Poisons Information Centre (Australia) – 24 hours : 13 11 26

This modified MSDS prepared by Ian McMahon based on ChemWatch data and Mallinckrodt Chemicals USA