

NOTES FOR TEACHERS



1. The material

Potassium aluminium sulphate (potash or common alum) – $\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$ – is reported to have a sweet, astringent taste and a relatively low toxicity. If accidentally ingested induce vomiting.

A modified MSDS is available as a pdf elsewhere on the web page.

The potash alum needed for crystal growing is inexpensive and easily obtained if it is not in your school. Each crystal grower or growing group should require no more than 150 grams of the alum.

Suppliers include **Ace Chemical Co.** Ph. 83760844 (www.acechem.com.au), **Omega Scientific Pty Ltd.** Ph. 82894311 (www.omegascientific.com.au), and **AIM Scientific** Ph. 8342 5870 (www.aimscientific.com.au). Costs and amounts available vary between suppliers.

2. Care during growing of the crystal (bottom of container)

Periodic weekly turning or inverting of the growing crystal may help a more regular growth pattern, but the disturbance often induces additional seeding, leading to the growth of “babies” and hence slower growth of the main crystal. Accidental damage of the growing crystal may also induce budding, leading to irregular crystals. Although the problem of unwanted growth may be overcome as set out in point 5 of the students’ instructions, the handling process may induce flaws in the main crystal. Certainly it is easier and may be better to let the crystal grow undisturbed even though this will prevent growth of the bottom face and that produce a truncated crystal.

3. Growing by suspension (alternative method)

To ensure a more regular three dimensional crystal growth is to suspend the growing seed crystal in the saturated solution. If a seed of reasonable size is chosen then it may be attached by a water-fast glue or by tying to a thin thread or hair and then suspended from a pencil placed across the lip of the beaker. This allows unimpeded growth on all sides and permits the full symmetry of the natural growth habit to be displayed.

Care must be taken not to touch crystals with bare fingers (gloves or tissues). Using glue is tricky – large globs must be avoided so that the aesthetic quality is not affected. Participants should understand that the inclusion of a hair or thread is NOT penalised by the judges.

4. The alum crystal shape

There is a variety of gross (macroscopic) forms for the alum crystal. These are crystallographically equivalent. More commonly, multi-faceted forms are produced for this competition but a careful choice of seed may lead to the octahedral form. It is entries with the octahedral form that have tended to be awarded the major prizes.

5. Handling of the final crystal

Alum crystals are relatively soft and brittle, and readily chip or break. Handling may cause etching or fogging of surfaces. Exposure to very low humidity air (<20%) can cause efflorescence – or whiteness and flaking at the edges. Hence storage in airtight conditions as soon after completion is recommended.

6. Time constraints

Growing large, good quality crystals requires some patience (including restarts from scratch). The exercise may take many weeks maybe a school term to get optimal size and quality from the quantities given. Attempts to speed up the process by using a warm or a ventilated site to enhance evaporation rate may cause problems with crystal quality or spontaneous seeding like the original step

7. Advice can be sought from Ian McMahon (ian.mcmahon@tsc.sa.edu.au) in the first instance.