

CRYSTAL GROWING: NOTES FOR TEACHERS

1. Potassium aluminium sulfate (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.
2. 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. On balance, therefore, it may be better - and it is certainly easier - to let the crystal grow undisturbed, even though this prevents growth of the bottom face, producing a somewhat truncated crystal.

3. Crystal Growing by Suspension Method

An often recommended way to ensure a more regular three dimensional growth of a crystal is to suspend the growing seed in the saturated solution. If the seed is removed when of a reasonable size, it may be attached by a water-fast glue, or by tying, to a thin thread or hair and 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.

The technique is not without problems, however. Care must be taken to avoid touching the crystals with the bare fingers; therefore gloves or tissues should be used. The gluing is tricky; it is difficult to avoid large globs of glue. Furthermore, the growing crystal engulfs the glue spot and thread and they are visible in cases such as alum where the crystal is colourless.

4. The alum crystal shape can assume a variety of gross forms, all of which are crystallographically equivalent. A multi-faceted form is more commonly found in this exercise, but a careful choice of seed may lead to the octahedral form. All forms are acceptable for submission in the competition.
5. Alum crystals are relatively soft and brittle, and readily chip or break. Handling may eventually cause some etching or fogging of the surfaces. Exposure to very dry air (humidity 10-20 per cent) may cause efflorescence, giving a flaking, white appearance at the edges. To avoid changes or damages to crystals they should be carefully wrapped and stored in airtight conditions as soon as possible.
6. Growing large, good quality crystals requires some patience. The present exercise may take up to ten weeks for optimal size and quality from the quantities given. Attempts to speed up the process by using a warm or a ventilated site to enhance the evaporation rate may cause problems with crystal quality or spontaneous seeding, resulting in a mat like that produced in the original seed-forming step.