Cultivating crystals

The specific qualities of crystals make them key materials in technological fields ranging from electronics and communications to energy, medicine and defence. For all these areas it is essential to dispose of crystals with the right properties, size and quality. Crystal growth has therefore become a major technological challenge.

Crystallogenesis

The point of crystallogenesis is simple: to form a solid object with atoms organised in a periodic array. This organisation is spontaneous, but time must be allowed for the process and the period varies with the compound in question.

Take your time to make large crystals

When a molten compound is suddenly cooled (tempered), its atoms "freeze", without regaining the long-range order they displayed before heating (amorphous glass). If cooling is sufficiently "slow", however, the atoms and molecules have time to move and optimise their interactions and compactness. If it is their basic factors which determine the atoms' order, which essentially depends on the compound's structure, these rearrangements permit the formation of new molecular or atomic layers which already solidified. Once a layer forms, it organises the order of the layer below and acts as a model or pattern for those above. The period of time may vary considerably according to each material. If you want to choose between a stack of small crystals or a few large crystals, you'll need more time!