The rudiments of crystallography

A tutorial lecture, XX International School on Physics and Chemistry of Condensed Matter

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I. Morphology of crystals:

- Morphology of crystals, symmetry operations and finite symmetry elements, classical crystals and quasicrystals, crystallographic point groups, crystal systems, international and Schönflies' symbols of point groups
- Algebraic treatment of symmetry operations, interactions of symmetry elements.

II. Crystal lattice

- Crystal lattice and crystal structure, selection of a unit cell, the crystal systems
- Crystallographic planes, direction and indices
- Bravais lattices
- Infinite symmetry elements: translation, glide planes of symmetry, screw axes of symmetry
- Crystallographic space groups, international symbols of crystallographic space groups relationships between space groups and point groups, general and special equivalent positions, asymmetric part of the unit cell

- Algebraic treatment of symmetry operations
- International Tables for Crystallography
- Reciprocal lattice, Laue classes of symmetry.

III. Elements of crystal chemistry

- An organic crystal as a super-molecule
- Intermolecular interactions in organic crystals in the context of crystal packing
- Supramolecular synthons
- Some examples of supramolecular structures.