

1.105: Symmetry operation

A **symmetry operation** is an **isometry**, *i.e.* a transformation under which two objects, or two configurations or an object, are brought to coincide. A symmetry operation is a Euclidean mapping: to each point of the first configuration there corresponds a point of the second configuration, the distances between two points are kept by the transformation, as are the angles.

The two configurations/objects can be either congruent or enantiomorphous. Correspondingly, the symmetry operations are classed into two kinds:

- **symmetry operations of first kind:** they relate congruent objects and consist of translations, rotations and screw rotations;
- **symmetry operations of second kind:** they relate enantiomorphous objects and consist of inversion, reflections, rotoinversions, and glide reflections. There exist a 1:1 correspondence between rotoinversion and roto reflections: the latter are more used in Schoenflies notation, whereas rotoinversions are preferred in Hermann-Mauguin notation.

A symmetry operation is performed about a symmetry element.

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