1.106: Symmorphic space groups

A space group is called 'symmorphic' if, apart from the lattice translations, all generating symmetry operations leave one common point fixed. Permitted as generators are thus only the point-group operations: rotations, reflections, inversions and rotoinversions. The symmorphic space groups may be easily identified because their Hermann-Mauguin symbol does not contain a glide or screw operation. The combination of the Bravais lattices with symmetry elements with no translational components yields the 73 symmorphic space groups, *e.g.* $P2$, Cm, $P2/m$, $P222$, $P32$, $P23$. They are in one to one correspondence with the arithmetic crystal classes.

A characteristic feature of a symmorphic space group is the existence of a special position, the site-symmetry group of which is isomorphic to the point group to which the space group belongs. Symmorphic space groups have no zonal or serial reflection conditions, but may have integral reflection conditions (*e.g.* $C2$, $Fmmm$).