1.3: Affine Isomorphism

Each symmetry operation of crystallographic group in E^3 may be represented by a 3×3 matrix **W** (the *linear part*) and a vector **w**. Two crystallographic groups $G_1 = \{(\mathbf{W}_{1i},\mathbf{w}_{1i})\}$ and $G_2 = \{(\mathbf{W}_{2i},\mathbf{w}_{2i})\}$ are called **affine isomorphic** is there exists a non-singular 3×3 matrix **A** and a vector **a** such that:

$G_2 = \{(\mathbf{A},\mathbf{a})(\mathbf{W}_{1i},\mathbf{w}_{1i})(\mathbf{A},\mathbf{a})^{-1}\}$

Two crystallographic groups are affine isomorphic if and only if their arrangement of symmetry elements may be mapped onto each other by an affine mapping of E^3. Two affine isomorphic groups are always isomorphic.