

10.6: Noncrystallographic symmetry

A symmetry operation that is not compatible with the periodicity of a crystal pattern (in two or three dimensions) is called a **noncrystallographic symmetry**. Rotations other than 1, 2, 3, 4, and 6 (in E^2 and E^3) belong to this type of symmetry. Rotations 5, 8, 10 and 12 are compatible with a translation in higher-dimensional spaces, but they are commonly considered noncrystallographic. For example, in quasicrystals fivefold or tenfold rotational axes are incapable of tiling space through the application of three-dimensional lattice translations, but they act as normal symmetry axes in a higher-dimensional space. Continuous rotations, which give rise to the Curie groups contained in the cylindrical system and in the spherical system, are noncrystallographic in any dimension.

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