An *incommensurate* composite crystal is a compound with two or more \((N)\) subsystems that are themselves modulated structures, with basis structures that are mutually incommensurate. Each subsystem (numbered by \(\nu\)) has a reciprocal lattice for its basic structure with three basis vectors

\[ a_i^{\nu} \]

. There is a basis of the vector module of diffraction spots that has at most \(3N\) basis vectors

\[ A_j^\nu \]

such that

\[ a_i^{\nu} = \sum_{j=1}^{n} Z_{ij}^\nu A_j^\nu \quad (i = 1, 2, 3), \]

where

\[ Z_{ij}^\nu \]

are integer coefficients. If \(n\) is larger than the dimension of space (three), the composite crystal is an aperiodic crystal. \(n\) is the rank of the vector module.

### Applications

Examples are intergrowth crystals and adsorbed monolayers. To the former belongs \(\text{Hg}_3\delta\text{AsF}_6\) with two systems of Hg chains inside the host lattice formed by AsF\(_6\) octahedra. Another example is nonadecane in the channels of a urea host crystal.

### Contributors

- [Online Dictionary of Crystallography](#)