The Nomenclature of Interpenetration

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The interpenetration of 1D, 2D and 3D networks (especially hydrogen bonded nets and coordination polymers) has become an important phenomenon in crystal engineering [1,2]. In such cases it is important that not only the topology of the interpenetrating networks is described, but also the topology of the interpenetration itself.

Therefore a simple descriptive nomenclature for describing the various modes of interpenetration is necessary. Interpenetration of 1D and 2D nets may be described as parallel or inclined interpenetration, depending on whether the mean directions of propagation (1D) (or mean planes (2D)) are co-linear (or parallel) or not, respectively. The overall topology of the entanglement may be of higher dimension than the individual networks, and thus descriptors of the form mD $\rightarrow$ nD, where mD is the dimensionality of the individual nets and nD is the dimensionality of the overall entanglement, can be used. It is also possible to indicate when nets of different dimensionality interpenetrate (e.g. 1D/2D $\rightarrow$ 3D). Finally, it is equally important to examine the topology of interpenetration for 3D nets – diamondoid networks, for example, can show a number of topologically different modes of interpenetration.

[1] Batten S.R., Robson, R., *Angew. Chem. Int. Ed.*, 1998, **37**, 1460. [2] Batten S.R., *CrystEngComm*, 2001, **3**, 67.

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