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Lattice Interpenetration and Other Adventures in Network Solids with NC-M-CN Rungs ($M = \text{Ag}, \text{N}$). Urs Geiser and John A. Schlueter, Materials Science Division, Argonne National Laboratory, 9700 South Cass Ave., Argonne, IL 60439, USA.

Three crystal structures relating to our ongoing exploration of metal-organic network solids with polyatomic bridging ligands, such as bent dicyanamide and its straight analog dicyanoargentate, will be presented. $\text{KMnAg}_3(\text{CN})_6$ ($P312$, $a = 6.922 \text{ \AA}$, $c = 8.146 \text{ \AA}$, $Z = 1$) three interpenetrating ReO_3 type lattices with Mn on the vertex and K ordered on one of the two possible interstitial sites [1]. The redetermined structure (originally described in [2]) of $\text{KAg}(\text{CN})_2$ ($P-31c$, $a = 7.383 \text{ \AA}$, $c = 17.593 \text{ \AA}$, $Z = 6$) contains alternating layers of potassium ions and twisted triads of dicyanoargentate. Interpenetration is also observed in $\text{KCd}_2[\text{N}(\text{CN})_2]_5(\text{H}_2\text{O})_4$ ($I-42m$, $a = 11.854 \text{ \AA}$, $c = 15.171 \text{ \AA}$, $Z = 4$), which is composed of two cross-weaving sets of orthogonal 2D networks.

These examples illustrate some of the surprises in attempts to engineer network solids by use of metal vertices and molecular ligands. Interpenetration is an important complication when networks with large pores are desired.

1. Geiser, U. & Schlueter, J. A. (2003), *Acta Cryst. C59*, i21.
2. Hoard, J. K. (1933), *Z. Kristallogr.* 84, 231.

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