

Three-dimensional Copper(I) Halide Based Coordination Networks with Asymmetrically Substituted Bridging N-Donor Ligands

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The discrete complex $[(\text{CuI})_2 (\text{pyzCN})_4]$ (**1**) and the coordination polymers $^1_\infty [\text{CuI}(\text{pyzCN})]$ (**2**) and $^3_\infty [(\text{CuX})_3 (\text{pyzCN})_2]$ (**3**, **4**; X = Br, Cl) may be prepared from the respective copper(I) halide CuX and 2-cyanopyrazine (pyzCN) by self-assembly in acetonitrile solution at 100–120°C. Whereas **2** exhibits $^1_\infty [\text{CuI}]$ staircase double chains as its characteristic substructure, the three-dimensional networks of **3** and **4** contain single zigzag CuX strings. The influence of the copper(I) halide on both the connectivity pattern and the dimensionality of a resulting coordination network is particularly apparent for the 1:1 complexes $^1_\infty [\text{CuI}(\text{pymMe})]$ (**5**), $^3_\infty [(\text{CuBr})_3(\text{pymMe})_3]$ (**6**) and $^2_\infty [\text{CuCl}(\text{pymMe})]$ (**7**), which were generated by reaction of CuX with 4-methylpyrimidine (pymMe) under reaction conditions similar to those above.