Electronic Supplementary Information

Magnetic Dimensionality and Crystal Structure of Two Copper(II) Coordination Polymers Containing Cu₆ and Cu₂ Building Units

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Fig S1: Coordination environment around the Cu(II) ions in hexanuclear units and the connection of hexanuclear units through azide bridges in the crystal structure of compound 1.
The spin Hamiltonian of the hexanuclear copper-azido cluster with similar magnetic pathways to compound 1 and $J$ parameter of interactions was written as\textsuperscript{50, 56}:

$$\hat{H}_{hexa} = -2J(\hat{S}_1\hat{S}_2 + \hat{S}_2\hat{S}_3 + \hat{S}_3\hat{S}_4 + \hat{S}_4\hat{S}_5 + \hat{S}_5\hat{S}_6 + \hat{S}_6\hat{S}_1)$$

Magnetic susceptibility for this model is given:

$$\chi_{hexa} = \frac{2Ng^2\beta^2}{kT} \frac{14 + 9 \exp \left(-\frac{10J}{kT}\right) + 25 \exp \left(-\frac{6J}{kT}\right)}{7 + 5 \exp \left(-\frac{12J}{kT}\right) + 25 \exp \left(-\frac{6J}{kT}\right)}$$

The molecular field term was used to describe intermolecular interactions (between hexanuclear units):

$$\chi_m = \frac{\chi_{hexa}}{1 - \chi_{hexa} \left(\frac{2zJ'}{Ng^2\beta^2}\right)}$$

The best fit gives parameters: \(g=1.83, J=3.56 \text{ cm}^{-1}, zJ'=0.53, R=2.2 \cdot 10^{-3}\), where \(R = \sum_{i=1}^{n} \left(\frac{\chi_{i}^{exp} - \chi_{i}^{calc}}{\chi_{i}^{exp}}\right)^2\). Although the match of $\chi_m(T)$ is good, the parameters obtained are incorrect. The discrepancy between experimental and theoretical curve is also seen in $\chi_mT(T)$. 
Fig S2: Temperature dependence of $\chi_m T$ product (magnetic susceptibility $\chi_m$ calculated per one Cu(II) ion). Inset represents $\chi_m(T)$ relation and the solid lines the best fitting of the data.

Fig. S3. XRD patterns of: simulated from the crystallographic data of compound 2 (a) and nanosheets of 2a synthesized by using the ultrasonic method (b)
Fig. S4. a) SEM image of 2a prepared with $[\text{Cu}^{2+}] = 0.15 \text{ M}$, $[\text{HL}] = 0.3 \text{ M}$, $[\text{Fe}^{2+}] = 0.1 \text{ M}$ and under a reaction time of 30 min; b) SEM image of 2b prepared with $[\text{Cu}^{2+}] = 0.15 \text{ M}$, $[\text{HL}] = 0.3 \text{ M}$, $[\text{Fe}^{2+}] = 0.1 \text{ M}$ and under a reaction time of 60 min; c) SEM image of 2c prepared with $[\text{Cu}^{2+}] = 0.015 \text{ M}$, $[\text{HL}] = 0.03 \text{ M}$, $[\text{Fe}^{2+}] = 0.01 \text{ M}$ and under a reaction time of 30 min.