Dehydration for a solid coordination network based on Cu\textsuperscript{II}-(py)$_2$C(OH)$_2$ trimers

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Materials consisting of metal ions or clusters that are linked by polyfunctional organic ligands form networks of different dimensionalities.\textsuperscript{1} Their structural features, including large cavities and high surface areas, have opened a wide range of applications in fields\textsuperscript{2} like gas storage and separation, drug delivery, chemical sensing, heterogeneous catalysis, biomedical imaging and others referred to their host-guest chemistry like water sorption for heat transformation. In this sense, the use of dipyridyl ligands is an effective strategy to produce extended structures. However, this strategy not always results in 3D networks, as occurred in the case herein presented.

A novel compound, [Cu$_3$((py)$_2$C(OH)$_2$)$_4$]·6H$_2$O (1), has been synthesized where (py)$_2$C(OH)$_2$ is the gem-diol of di-2-pyridyl ketone ((py)CO). The dehydrated phase, [Cu$_3$((py)$_2$C(OH)$_2$)$_4$] (2), has been obtained after a heating treatment. Both crystal structures consist of trimers constituted by Cu$^{II}$ metal ions connected by the gem-diol bridging ligands. Hydrogen bonding and π-π interactions are responsible for the 3D packing of these trimers. Thermal and magnetic properties have been measured for 1, by means of X-ray thermogravimetry (TG), X-ray thermodiffractometry (TDX), and electron paramagnetic resonance (EPR).

Figure 1: Compound [Cu$_3$((py)$_2$C(OH)$_2$)$_4$]·6H$_2$O (1).

References

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