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

Laura Bravo-García*¹, Gotzone Barandika², Begoña Bazán^{1,3}, Miren K. Urriaga¹, Luis M. Lezama^{2,3} and María I. Arriortua^{1,3}

¹*Departamento de Mineralogía y Petrología*

²*Departamento de Química Inorgánica, Facultad de Ciencia y Tecnología, Universidad del País Vasco (UPV/EHU), Apdo. 644, 48080 Bilbao, Spain*

Email: laura.bravo@ehu.eus, gotzone.barandika@ehu.eus, bego.bazan@ehu.eus, karmele.urriaga@ehu.eus, luis.lezama@ehu.es, maribel.arriortua@ehu.eus

³*BCMaterials, Parque Tecnológico de Zamudio, Ibaizabal Bidea, Edificio 500-Planta 1, 48160, Derio, Spain*

Materials consisting of metal ions or clusters that are linked by polyfunctional organic ligands form networks of different dimensionalities.¹ Their structural features, including large cavities and high surface areas, have opened a wide range of applications in fields² 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 dipyriddy 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, $[\text{Cu}_3((\text{py})_2\text{C(OH)}_2)_4]\cdot 6\text{H}_2\text{O}$ (**1**), has been synthesized where $(\text{py})_2\text{C(OH)}_2$ is the gem-diol of di-2-pyridyl ketone ((py)CO). The dehydrated phase, $[\text{Cu}_3((\text{py})_2\text{C(OH)}_2)_4]\cdot$ (**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 thermodiffraction (TDX), and electron paramagnetic resonance (EPR).

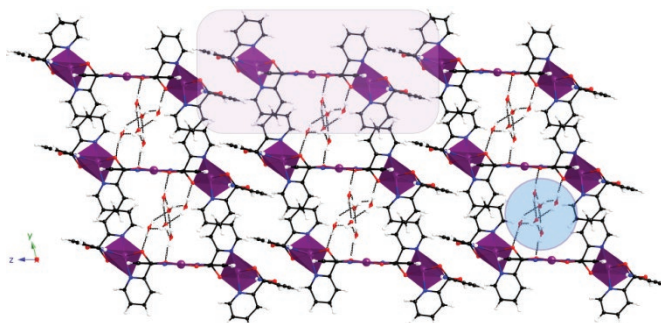


Figure 1: Compound $[\text{Cu}_3((\text{py})_2\text{C(OH)}_2)_4]\cdot 6\text{H}_2\text{O}$ (**1**).

References

1. M. Li, D. Li, M. O’Keeffe and O. M. Yaghi, *Chem. Rev.*, 2014, **114**, 1343-1370
2. C. Wang, D. Liu, and W. Lin., *J. Am. Chem. Soc.*, 2013, **135**, 13222-13234.

Acknowledgments

This work was supported by the “Ministerio de Economía y Competitividad” (MAT2013-42092-R), the “Gobierno Vasco” (Basque University System Research Groups, IT-630-13) and UPV/EHU (UFI11/15). The authors acknowledged the support received by the European Regional Development Fund (ERDF). The technical and human support provided by SGIker (EHU/UPV) is gratefully acknowledged. L. Bravo thanks the UPV/EHU for her formation scholarships.