MS30-1-5 Chiral 3D Metal-Organic Frameworks with Zinc and Hydroxy-Amino Acids
#MS30-1-5

D. Vušak [1], V. Idek [1], B. Prugovečki [1]
[1]**Department of Chemistry, Faculty of Science, University of Zagreb - Zagreb (Croatia)**

Abstract
Metal-organic frameworks are well explored class of materials with over 110000 datasets in Cambridge Structural Database (CSD, version 2021.3.0) [1]. Only 114 of those contain zinc and α-amino acid or amino acid derivative, and only 1 dataset is a 3D MOF containing zinc, 4,4'-bipyridine and amino acid (L-lysine) [2]. Introduction of a chiral molecule in MOF increases possibilities for their potential applications, e.g. for enantioselective catalysis or separation or for tuning magnetic properties [3].
As part of our investigation of porous materials involving essential metal atoms and biologically important compounds [4–7], we report four 3D chiral cationic MOFs with zinc, 4,4'-bipyridine (bipy) and L-serine (HSer) or L-threonine (HThr). One L-serinato, $\{[Zn_2(\mu\text{-Ser})_2(\mu\text{-bipy})_3](NO_3)_2\cdot(DMF/water)\}_n$ (**1**), and three L-threoninato MOFs were obtained: two solvates of the same framework formula unit $\{[Zn_4(\mu\text{-Thr})_4(H_2O)(\mu\text{-bipy})_4(DMF)](NO_3)_4\cdot(DMF/water)\}_n$ (**2a** and **2b**) and $\{[Zn_2(\mu\text{-Thr})_2(H_2O)(\mu\text{-bipy})_3](NO_3)_2\cdot 2bipy\cdot 2H_2O)\}_n$ (**2c**). **1** and **2c** have a higher volume ratio of crystallization solvent and/or bipyridine molecules (>40%) and form 2D channels, while in **2a** and **2b** 25–28% of the unit cell volume is occupied by solvent molecules forming 1D channels. The influence of solvent on crystallization and coordination modes is discussed, as well as a comparison of syntheses, crystal structures and properties of compounds.

References
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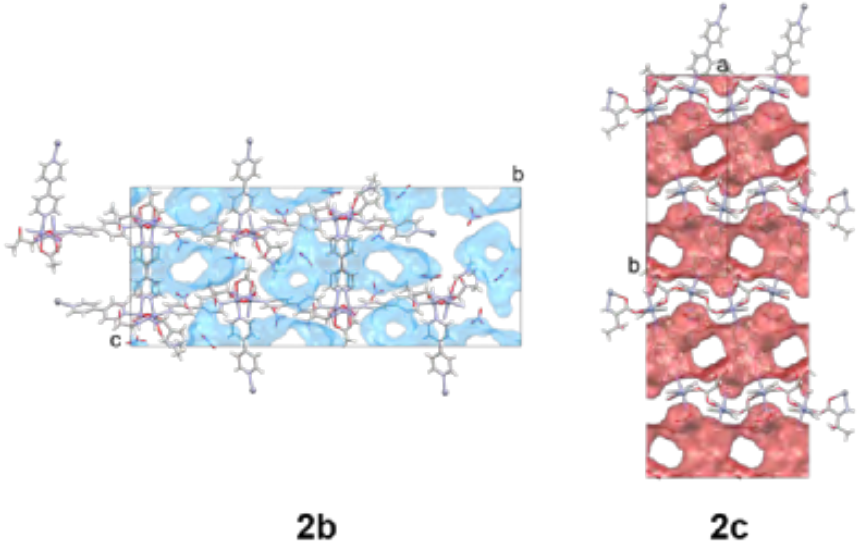
Figure 1. Channels of solvent and/or bipyridine



2b 2c