22nd Iranian Inorganic Chemistry Conference,
23-25 August, 2023
University of Kurdistan

Concomitant crystallization of supramolecular isomers: 2-fold interpenetrated and non-intenterpenetrated coordination polymers

Bahareh Rezaei Kheirkhah, Ghazale Khorshidi and Behrouz Notash*

Department of Inorganic Chemistry, Shahid Beheshti University, 1983969411, Tehran, Iran.

* *E-mail: b_notash@sbu.ac.ir*

Coordination polymers (CPs) have been undergoing rapid development due to their facile functionalization [1], diverse topologies [2] and varied potential applications [3,4]. Supramolecular isomerism is used to describe the existence of more than one type of supramolecular network for a given set of components. To the best of our knowledge, research on the concomitant formation of supramolecular isomers is still rare [5].

In this work, we report the one-pot synthesis of two CPs, namely $\{[Cd(L)_{1.5}(NO_3)_2](L)_{0.5}\}_n$ (**1**) and $[Cd(L)_{1.5}(NO_3)_2]_n$ (**2**), by the self-assembly process using cadmium (II) ion as metallic tectons and pyridine containing ligand (**L**) as organic tectons in EtOH. These compounds were structurally characterized by single-crystal X-ray diffraction analysis and further characterized by powder X-ray diffraction (PXRD). As illustrated in Fig. 1, compound **1** can be considered as 2-fold interpenetrated framework, while compound **2** is a non-intenterpenetrated coordination polymer. Hirshfeld surface analysis of the compounds **1** and **2** have been performed to investigate the relative contributions of each interaction in crystal packing.

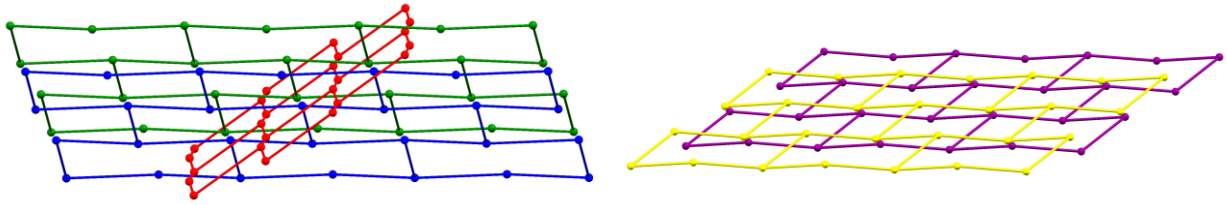


Fig. 1 Schematic view of 2- fold interpenetrated 2D CP in **1** (left) and non-interpenetrated 2D CP in **2** (right).

Keywords: coordination polymer, cadmium, concomitant.

References

[1] Kitagawa, S.; Kitaura, R.; Noro, S., *Angew. Chem., Int. Ed.* **2004**, 43, 2334.
[2] M. S. Ahmad, M. Khalid, M. S. Khan, M. Shahid and M. Ahmad, *CrystEngComm*, **2021**, 23, 6253.
[3] D. X. Xue, Q. Wang and J. Bai, *Coord. Chem. Rev.*, **2019**, 378, 2.
[4] Z. Zhou, M. Vazquez-Gonzalez and I. Willner, *Chem. Soc. Rev.*, **2021**, 50, 4541.
[5] J.-S. Hu, L. Qin, M.-D. Zhang, X.-Q. Yao, Y.-Z. Li, Z.-J. Guo, H.-G. Zheng and Z.-L. Xue, *Chem. Commun.*, **2012**, 48, 681.