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

Investigation of the effect of surface functional groups on iodine sorption properties of a 2D zinc (II) coordination polymer

Mohsen Valipour Salmanvand, Qasem Maleki, Valiollah Nobakht*, Hassan Alijani

Department of Chemistry, Faculty of Science, Shahid Chamran University of Ahvaz, Ahvaz, Iran

* *E-mail: v.nobakht@scu.ac.ir*

In this work, a two-dimensional zinc(II) coordination polymer (Zn-CP, **1**) has been selected for consecutive post-synthetic modifications. In the first step, the coordinated solvent was removed to create the solvent-free structure Zn-CP-df (**2**) with open-coordination or Lewis acid sites. Then, the solvent-free structure **2** was functionalized by ethylene diamine and 1,3-diamino propane to obtain amine functionalized structures Zn-CP-en (**3**) and Zn-CP-DAP (**4**), respectively containing Lewis base sites. Finally, Zn-CP-en was reacted with chlorosulfonic acid ($ClSO_3H$) to obtain Zn-CP-SO_3H (**5**) with Bronsted acid sites. The capability of compounds **1-5** in iodine sorption in both vapor and liquid phases was investigated in detail. The results show outstanding iodine capture for both amine functionalized structures Zn-CP-en (100% wt) and Zn-CP-DAP (204%) [1-4].

Keywords: Coordination polymer, Surface group, Post-synthetic modification, Iodine sorption

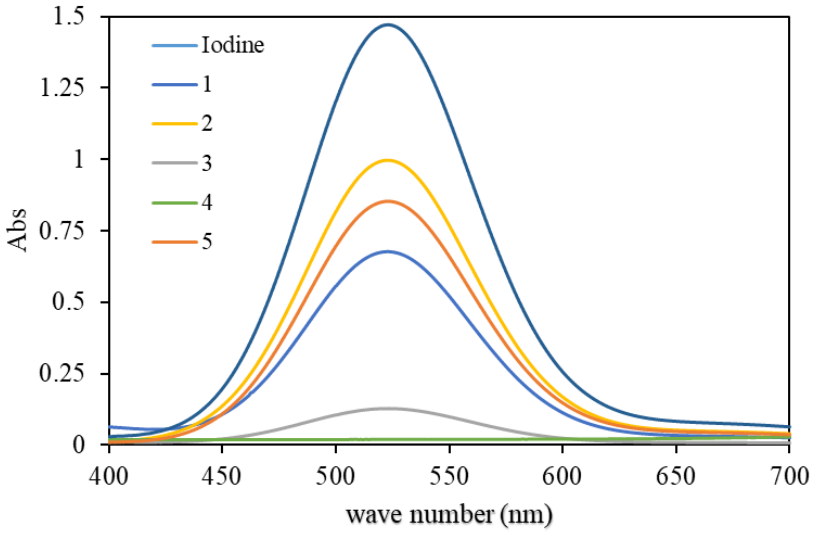


Fig. 1 Iodine sorption of compounds 1-5

References

[1] M Yadollahi, H Hamadi, V Nobakht, *Journal of Hazardous Materials*, **2020** 399 122872.
[2] A. Tarassoli, V. Nobakht, E. Baladi, L. Carlucci, D. M Proserpio, *CrystEngComm*, **2017** 19 6116-6126.
[3] E. Baladi, V. Nobakht, A. Tarassoli, D. M. Proserpio, L. Carlucci, *Crystal Growth & Design*, **2018** 18 7207-7218.
[4] V. Safarifard, A. Morsali, *CrystEngComm*, **2014** 16 8660.