LOPHINE BASED-MULTIFUNCTIONAL MOFs AND THEIR APPLICATIONS TOWARDS SENSING AND CATALYSIS

Sharad Kumar Sachan, Sarita Tripathi, Namita Singh, Anjali Rajora, Renganathan Srirambalaji, Pawan Gupta, Anshu Rani, and Anantharaman Ganapathi

Department of Chemistry, Indian Institute of Technology (IIT), Kanpur, Kanpur-208016, Uttar Pradesh, India
garaman@iitk.ac.in

Porous materials such as zeolites have a significant impact on both industrial and day-to-day applications. The structural rigidity created by primary $[SiO_4]^{4-}$ and $[AlO_4]^{3-}$ units, which is associated with the framework stability, is one of the prime criteria for its vast applications.[1] Alternatively, coordination polymers (CPs) or metal-organic frameworks (MOFs) have gained enormous attention due to their simplicity in preparation, structural diversity, and applications in gas adsorption, separation of small molecules, catalysis, sensing of small molecules to hazardous materials, drug delivery, nonlinear optics, proton conductivity, and other biomedical-related processes. Befittingly, the Nobel Prize is awarded in 2025 *"for the development of metal–organic frameworks*". The robustness of MOFs against hydro- and thermal-stability in different pH solutions, without losing crystallinity or porosity, is an essential criterion for the above potential applications.[1] Herein, the CPs/MOFs derived from imidazole-carboxylic acids (H_3Imtb and 2,4-Imdb), their robust nature in aqueous solution, and their applications towards the areas of sensing/remediation of hazardous materials and catalysis will be presented.[2]

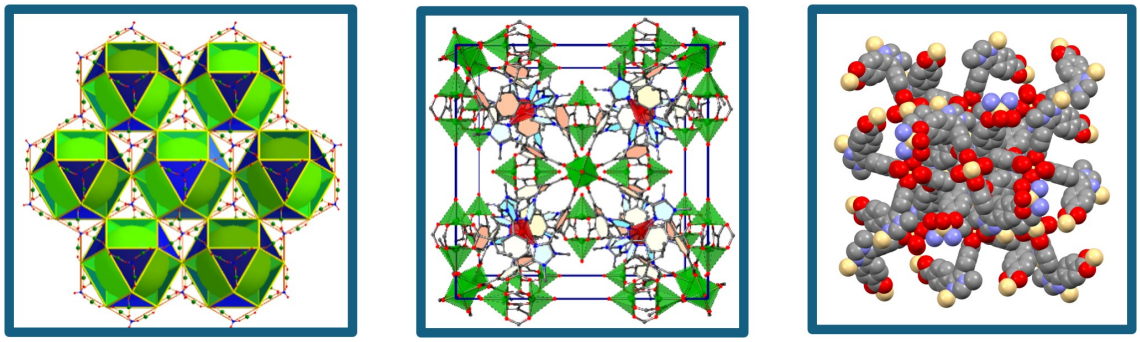

Figure: MOFs of indium, copper, and cadmium

[1] (a) Kitagawa, S.; Kitaura, R.; Noro, S. *Angew. Chem., Int. Ed.* **2004**, *43*, 2334. (b) Kreno, L. E.; Leong, K.; Farha, O. K.; Allendorf, M.; Van Duyne, R. P.; Hupp, J. T. *Chem. Rev.* 2012, *112*, 1105. (c) Zhou, H.-C.; Long, J. R.; Yaghi, O. M. *Chem. Rev.*, 2012, *112*, 673. (d) Huang, Y.-B.; Liang, J.; Wang, X.-S.; Cao, R. *Chem. Soc. Rev.*, 2017, *46*, 126. (e) https://www.nobelprize.org/prizes/chemistry/2025/summary/

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