**Fabrication and adsorptive performance of ZIF-8 and MIL-100(Fe) for the efficient adsorption of chlorpyrifos from water**

**Sonali Goyal\*, Arunima Nayak, Brij Bhushan**

**Department of Chemistry, Graphic Era (deemed to be) University, Dehradun**

**Corresponding Author:** [*sonaligoyal7397@gmail.com*](mailto:sonaligoyal7397@gmail.com)

Discharge of pesticides in wastewater from industries, agricultural activities etc., even at trace levels poses significant environmental risks to aquatic lives and human health. Metal-organic frameworks (MOFs) have emerged as highly effective adsorbents for water remediation due to their high surface area, good chemical stability and multi-functionality. In this study, two different metal-organic frameworks (Materials of Institute Lavoisier: MIL-100 (Fe) and Zeolite imidazole Framework: ZIF-8) was fabricated via a green and facile method for the removal of chlorpyrifos. The fabricated adsorbents were characterized by FTIR, BET and FESEM analyses. The effect of several parameters such as adsorbent dosage, initial dye concentration and contact time were well studied and optimized using batch adsorption study. At an optimized condition of initial concentration=20 mg/L, contact time =30mins and adsorbent dosage=0.01g, the removal efficiency of MIL-100(Fe) and ZIF-8 was found to be 94% and 88% respectively. Comparative assessment was made between the two adsorbents with respect to the characterization analysis and adsorptivity results.

Keywords: MOF, adsorbents, wastewater treatment, chlorpyrifos

**References**

Cobian-Solorio, G. A., Aguayo-Villarreal, I. A., Rojas-Mayorga, C. K., Muñiz-Valencia, R., Emparan-Legaspi, M. J., & Guzman, N. D. (2025). Non-steroidal anti-inflammatory drugs adsorption from aqueous solution by MOFs MIL-100 (Fe), ZIF-8 and UiO-66: Synthesis, characterization, and comparative study. *Journal of Molecular Structure*, *1321*, 139698.

Zhong, Y., Mu, X., & Cheang, U. K. (2022). High-performance and selective adsorption of ZIF-8/MIL-100 hybrids towards organic pollutants. *Nanoscale advances*, *4*(5), 1431-1444.