**Eco-Friendly Zr-Metal Organic Framework Materialfor Efficient**

**Remediation of Different Types of Dyes**

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**Abstract**

Bio-MOF using aspartic acid as an organic linker and water as a solventwas performed to create an eco-friendly material. The chemical composition, structure,and morphology of the synthesized zirconium Bio-MOF (MIP-202) was evaluated using X-raydiffraction (XRD), energy dispersive X-ray (EDX) spectroscopy, transmission electron microscopy(TEM), scanning electron microscopy (SEM), and X-ray photoelectron spectroscopy (XPS).The adsorption capability of the synthesized Zn-adeninate bio-MOF was confirmed by itsnotable surface area of 52.62m2 g−1 and total pore volume of 0.183 cm3 g−1. The bio-MOF adsorption profiles of anionic directred 81 (DR-81) and cationic methylene blue (MB) dyes were investigated under different operating parameters. The optimumdosages of Zn-adeninate bio-MOF were 0.5 g L−1 and 1 g L−1 for MB and DR-81 decolorization, respectively.Kinetic parameters were well-fitted with pseudosecond-order kinetics, and the adsorption process was described by the Freundlich isotherm.

*Keywords: zirconium Bio-MOF;adsorption process;ecofriendly materials; Kinetic models; methylene blue*

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