

Metal Organic Frameworks Based Nanomaterial: Synthesis and Applications; Removal of Heavy Metal Ions from Waste Water



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Abstract Heavy metals in the water are a global environmental issue. Heavy metals in the wastewater are increasing day by day which is mainly caused by various industrial effluents. Heavy metal ions including, Cadmium (II), Arsenic (III and V), Chromium (III and VI), Copper (II), Lead (II), and Mercury (II) are accumulated readily in the environment. It has been created a lot of serious problem to the human health. Thus, removal of heavy metals from the wastewater is one of the major challenges for the scientific community. Various techniques and materials have been developed for removal of heavy metals from the waste water. Recently, Metal organic frameworks (MOFs) based nanomaterial has been synthesized and used for removal of heavy metal ions from waste water. Electrochemical, photo-chemical energy conversion and storage, biomedical imaging, drug delivery and catalysis, have been investigated. Its unique characteristic properties are accountable for the waste water treatment like easily synthesizable, various size cavities with different-different functional group, surface functional groups, various functionality where host-guest interaction takes place and high surface area which responsible for high absorption capacity. In this chapter, the attention is given to understand the synthesis, chemistry of MOF based nano-composites and its various applications especially, and removal of heavy metals from waste water has been discussed. It is expected that this chapter can be helpful to understand the synthesis of MOF-based nano-materials and its application towards the elimination of heavy metal ions from waste water.

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