

Nanomaterials and Metal organic framework (MOFs): the innovative applications in the Environment

Shehdeh Jodeh*

Department of Chemistry, An-Najah National University, P. O. Box 7, Nablus, Palestine.

*Presenting author E-mail: sjodeh@hotmail.com

Thematic Area: 1.3. Nanomaterials sciences & Environment

Abstract

Metal-organic framework (MOF) is a class of inorganic-organic hybrid material assembled periodically with metal ions and organic ligands. MOFs have always been the focuses in a variety of frontier fields owing to the advantageous properties, such as large BET surface areas, tunable porosity and easy-functionalized surface structure. Among the various application areas, catalysis is one of the earliest application fields of MOFs-based materials and is one of the fastest-growing topics. In this review, the main roles of MOFs in heterogeneous organocatalysis have been systematically summarized, including used as support materials (or hosts), independent catalysts, and sacrificial templates.

The environment sustenance and preservation of global climate are known as the crucial issues of the world today. Currently, the crisis of global warming due to CO₂ emission has turned into a paramount concern. To address such a concern, diverse CO₂ capture and sequestration techniques (CCS) have been introduced so far. In line with this, Metal Organic Frameworks (MOFs) have been considered as the newest and most promising material for CO₂ adsorption and separation. Due to their outstanding properties, this new class of porous materials have exhibited a conspicuous potential for gas separation technologies especially for CO₂ storage and separation.

The increasing demand of safe and clean water pushes scientists to develop advanced treatment techniques to overcome the water scarcity problem. Scientists have developed different nanomaterials for the treatment of contaminated water. Nanomaterials play an important role in environmental remediation. Nanotechnology is an emerging technology in the field of wastewater treatment, and it effectively destroys/removes most of the recalcitrant organic pollutants and toxic compounds from wastewater.

Keywords: hybrid, materials, pollution, adsorption, MOF.