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MOFs for novel biomedical and environmental applications

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The involvement of Metal-Organic Frameworks (MOFs) in biomedical applications is currently one of the hot topics in the emerging field of hybrid porous solids. In particular, nanometric iron carboxylate MOFs (nanoMOFs) have recently attracted a great deal of attention owing to their large porosity and versatile composition, enabling to entrap remarkable loadings of a wide variety of challenging molecules, including drugs and toxins [1]. However, for the practical use of MOF nanocarriers, it is necessary to investigate their safety, biodistribution and efficiency [2]. Here, the administration of MOFs by different administration routes (e.g. intravenous, oral, cutaneous, pulmonary) will be presented [3] together with some MOF based composites [4]. Further, the therapeutic misadventures, illicit drug ingestion or attempted suicide by using of drug overdoses is a major worldwide public health problem. Unfortunately, current treatments are accused of being ineffective and even of causing unnecessary complications, inducing severe adverse effects. In this context, MOFs has also recently demonstrated to be promising safe and efficient oral detoxification agents [5]. MOFs can not only acts as contaminant adsorbents in the body, but also in polluted water, selectively removing contaminants (e.g. drugs, toxins) by adsorption and photocatalytic degradation, improving the performance of the current inefficient materials [6].

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