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Efficient Removal of Heavy Metal Ions from Water Using Urea-Functionalized Metal-Organic Frameworks

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The pollution of surface and groundwater with heavy metals is a serious global concern, both environmentally, as well as with respect to human health. Recently, porous metal-organic frameworks (MOFs), with metallic clusters and organic linkers, have been developed as promising structures in capturing different toxic and hazardous substances, including heavy metal ions, because of their unique features[1-5]. This study synthesized two copper-based MOFs, using hydrothermal methods. These MOFs are densely decorated with urea functional groups, which enable them to selectively and efficiently remove various heavy-metal ions, such as Hg^{2+} and Pb^{2+}, from water. The structures of these MOFs allow for the effective sorption of these metal ions. This research demonstrates urea-functionalized MOFs as a highly efficient adsorbent for removing heavy metals.

Keywords: Water pollution, Heavy metal ions, Metal-organic framework (MOF), Adsorption, Removal

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