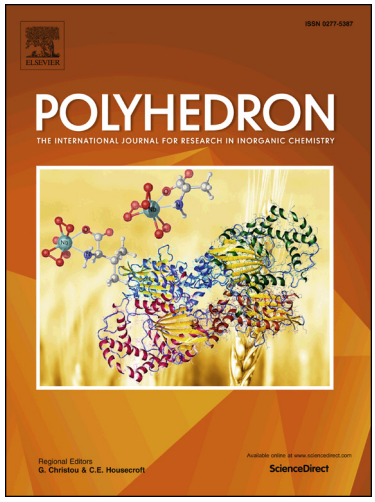

Highly efficient photocatalytic Cr(VI) reduction and organic pollutants degradation of two new bifunctional 2D Cd/Co-based MOFs

Xiao-Hong Yi, Fu-Xue Wang, Xue-Dong Du, Huifen Fu, Chong-Chen Wang

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Highly efficient photocatalytic Cr(VI) reduction and organic pollutants degradation of two new bifunctional 2D Cd/Co-based MOFs

Xiao-Hong Yi, Fu-Xue Wang, Xue-Dong Du, Huifen Fu, Chong-Chen Wang*

Beijing Key Laboratory of Functional Materials for Building Structure and Environment Remediation/Sino- Dutch R&D Centre for Future Wastewater Treatment Technologies, Beijing University of Civil Engineering and Architecture, Beijing 100044, China

Abstract

Two new 2D metal-organic frameworks (MOFs), $[Cd(bpy)(H_2O)L]_n$ (**BUC-66**) and $\{Co(bpy)(H_2O)L]\cdot H_2O\}_{2n}$ (**BUC-67**), (H_2L = *cis*-1,3-dibenzyl-2-imidazolidone-4,5- dicarboxylic acid, bpy = 4,4′-bipyridine), have been synthesized under hydrothermal conditions. These two 2D MOFs were used to carry out photocatalytic Cr(VI) reduction and organic pollutants degradation. The results revealed that both **BUC-66** and **BUC-67** displayed outstanding photocatalytic Cr(VI) reduction performances with reduction efficiency more than 98% within 30 min under UV light irradiation, much better than that of commercial P25 (24%). Also, **BUC-66** and **BUC-67** could photocatalytically decompose organic dyes. These two MOFs exhibited considerable photocatalytic activities in the Cr(VI)/organic dyes matrix. Upon UV light illumination for 30 min, the Cr(VI) reduction efficiency reached 100%, along with the organic dye (methyl orange) degradation efficiency being 85% (**BUC-66**) and 100% (**BUC-67**). Finally, a possible photocatalytical reaction mechanism have been proposed and

*Corresponding author. Tel.: +86 10 61209186; fax: +86 10 61209186.

E-mail address: chongchenwang@126.com