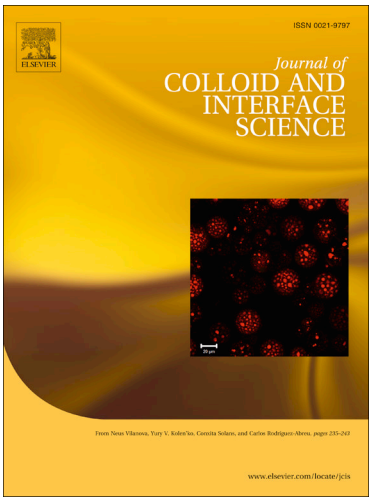

Construction of CdS@UIO-66-NH_2 core-shell nanorods for enhanced photocatalytic activity with excellent photostability

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PII: S0021-9797(18)30370-9
DOI: https://doi.org/10.1016/j.jcis.2018.03.114
Reference: YJCIS 23464

To appear in: *Journal of Colloid and Interface Science*

Received Date: 17 January 2018
Revised Date: 26 March 2018
Accepted Date: 30 March 2018

Please cite this article as: Q. Liang, S. Cui, C. Liu, S. Xu, C. Yao, Z. Li, Construction of CdS@UIO-66-NH_2 core-shell nanorods for enhanced photocatalytic activity with excellent photostability, *Journal of Colloid and Interface Science* (2018), doi: https://doi.org/10.1016/j.jcis.2018.03.114

Construction of CdS@UIO-66-NH_2 core-shell nanorods for enhanced photocatalytic activity with excellent photostability

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Abstract:

A novel class of CdS@UIO-66-NH_2 core shell heterojunction was fabricated by the facile *in-situ* solvothermal method. Characterizations show that porous UIO-66-NH_2 shell not only allows the visible light to be absorbed on CdS nanorod core, but also provides abundant catalytic active sites as well as an intimate heterojunction interface between UIO-66-NH_2 shell and CdS nanorod core. By taking advantage of this property, the core-shell composite presents highly solar-driven photocatalytic performance compared with pristine UIO-66-NH_2 and CdS nanorod for the degradation of organic dyes including malachite green (MG) and methyl orange (MO), and displays superior photostability after four recycles. Furthermore, the photoelectrochemical performance of CdS@UIO-66-NH_2 can be measured by the UV-vis spectra, Mott-Schottky plots and photocurrent. The remarkably enhanced photocatalytic activity of CdS@UIO-66-NH_2 can be ascribed to high surface areas, intimate interaction on molecular scale and the formation of one-dimensional heterojunction with n-n type. What's more, the core-shell heterostructural CdS@UIO-66-NH_2 can facilitate the effective separation and transfer of the photoinduced interfacial electron-hole pairs and protect CdS nanorod core from photocorrosion.

Keywords: UIO-66-NH_2; CdS nanorod; Core-shell; Photocatalysis

1. Introduction

Semiconductor-based photocatalysis with its green and sustainable advantages can be seen as a promising approach for environment sustainability [1-3]. Among the visible-light-driven semiconductors, CdS is attracting great

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