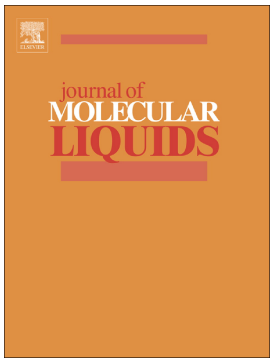

Synthesis of copper-loaded activated carbon for enhancing the photocatalytic removal of methylene blue

Xin Jiang, Hongying Xia, Libo Zhang, Song Cheng, Qi Zhang, Quan Chen, Wenhai Hu

PII: S0167-7322(18)33180-5
DOI: doi:10.1016/j.molliq.2018.09.087
Reference: MOLLIQ 9693

To appear in: *Journal of Molecular Liquids*

Received date: 21 June 2018
Revised date: 27 August 2018
Accepted date: 17 September 2018

Please cite this article as: Xin Jiang, Hongying Xia, Libo Zhang, Song Cheng, Qi Zhang, Quan Chen, Wenhai Hu , Synthesis of copper-loaded activated carbon for enhancing the photocatalytic removal of methylene blue. Molliq (2018), doi:10.1016/j.molliq.2018.09.087

Synthesis of copper-loaded activated carbon for enhancing the photocatalytic removal of methylene blue

Xin Jiang, Hongying Xia*, Libo Zhang**, Song Cheng, Qi Zhang, Quan Chen, Wenhai Hu

[1]State Key Laboratory of Complex Nonferrous Metal Resources Clean Utilization, Kunming University of Science and Technology, Kunming, 650093, Yunnan, China

[2]Yunnan Provincial Key Laboratory of Intensification Metallurgy, Kunming University of Science and Technology, Kunming 650093, Yunnan, China

[3]Key Laboratory of Unconventional Metallurgy, Ministry of Education, Kunming 650093, Yunnan, China

[4]Faculty of Metallurgy and Energy Engineering Kunming University of Science and Technology, Kunming 650093, Yunnan, China.

Abstract

To enhance the photocatalytic performance of Cu_2O, the spent activated carbon (SAC) directly supported CuO powder and then was heated by microwaves to prepare an economical photocatalyst copper-loaded activated carbon (Cu/AC). The prepared Cu/AC catalyst was characterized by N_2 adsorption-desorption, X-ray diffraction (XRD), scanning electron microscopy (SEM), energy dispersive spectrometry (EDS), X-ray photoelectron spectroscopy (XPS), Raman spectroscopy and the zero charge point (pH_{pzc}). The analysis results indicated that Cu/AC had an important specific surface area of 1135 m^2/g and mainly contained Cu_2O and metallic copper (Cu^0). The Cu_2O particles were successfully loaded on the activated carbon. The photocatalytic activity of prepared Cu/AC was evaluated by means of methylene blue (MB) degradation. The effects of reaction parameters such as the pH, initial

* Corresponding author, **Co-Corresponding author at: State Key Laboratory of Complex Nonferrous Metal Resources Clean Utilization, Kunming University of Science and Technology, Kunming, Yunnan 650093, China.

E-mail address: hyxia@kmust.edu.cn (H.Y. Xia), zhanglibopaper@126.com (L.B. Zhang)