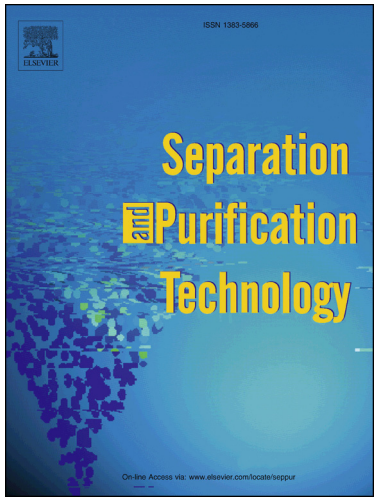

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Xinjuan Zhang, Yu Chen, Sheng Zhang, Caiyu Qiu

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High photocatalytic performance of high concentration Al-doped ZnO nanoparticles

Xinjuan Zhang ‡ [a, b, c]*, Yu Chen ‡[d], Sheng Zhang [c], Caiyu Qiu [a, b]

[a] *Institute of Biomaterials and Engineering, Wenzhou Medical University, Wenzhou 325035, China*

[b] *Wenzhou Institute of Biomaterials and Engineering, CNITECH, CAS, Wenzhou 325000, China*

[c] *Key Laboratory of Carbon Fiber and Functional Polymers (Beijing University of Chemical Technology, Ministry of Education), Beijing 100029, China*

[d] *Beijing Huateng Hightech Corp., Beijing 100084, China*

Abstract

With increasing demands for environmental protection, photocatalyst has attracted great attentions, and ZnO based photocatalyst is an attractive system to study. Doping with other elements can significantly enhance the photocatalytic activity, conductivity and transmittance of ZnO. However, it is difficult to synthesize high doping concentration ZnO because of the high formation energy. In this work, high doping concentrations (up to 20 mol%) Al-doped ZnO (AZO) were prepared via sol-gel combustion method, which showed excellent photocatalytic activities, several times more efficient than previous reports. The nanoparticles containing 20% Al already showed unprecedented absorption capacity, leading to a great decrease of MO concentration from 200 to 2.7 mg/L, and further photodegrade MO thoroughly within 30 min irradiation. The mechanism of photocatalysis

‡ The authors contributed equally to the work.

* Corresponding author. *E-mail address:* Zhangxj@wibe.ac.cn (X. Zhang).