Short Communication

Preparation of Magnetic Iron/Graphitic Mesoporous Carbon Composites as Efficient Returnable Adsorbents for Methyl Orange Removal

Lifeng Cui^{1,*}, Mingcui Yao², Xia Bai², Lu Zhang², Shifei Kang^{2,*}

¹ School of Chemistry and Environmental Engineering, Dongguan University of Technology, Guangdong 523808, P. R. China.

² Department of Environmental Science and Engineering, University of Shanghai for Science and Technology, Shanghai 200093, China

*E-mail: lifeng.cui@gmail.com, sfkang@usst.edu.cn

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The mesoporous silica SBA-15 was regarded as the template to synthesize a variety of magnetic iron/graphitic mesoporous carbon (Mag-GMC) composites, via a simple one-step solid-liquid grinding/templating route. The physicochemical properties of these composites were characterized by X-ray diffractometry, nitrogen sorption isotherms, transmission electron microscopy and vibrating-sample magnetometry. The methyl orange (MO) removal effects of these composites as adsorbents were investigated via a batch adsorption technique, and the effects of contact time and initial MO concentration on the adsorption capacity were also discussed. Also, the zeta potential of the as-prepared Mag-GMC composites was measured and compared. Mag-GMC-0.5 shows the highest MO adsorption ability of 90.6 mg/g, which is much higher than that of commercial active carbon. Recycle adsorption experiments indicate that the Mag-GMC composites are promising in returnable dye removal. The excellent adsorption performance can be ascribing to its unique mesoporous structure and decent zeta potential.

Keywords: Magnetic materials, Graphitic mesoporous carbon, Adsorption, Dye removal, zeta potential

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