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A facile and novel route for the direct synthesis superparamagnetic ordered mesoporous carbon

Xin Fu^a, Shaomin Liu^{a, *}, Dongliang Zhu^{b, *}, Yingbo Xu^b, Xiangyang Yan^a

^a Department of Chemistry, University of Science and Technology of China, Hefei, 230026, P. R. China, Tel. & Fax: +86 551 63492147; E-mail address: liusm@ustc.edu.cn (Shaomin Liu)

^b The USTC-Anhui Tobacco Joint Laboratory of Chemistry and Combustion, Hefei, 230066, P. R. China; E-mail: zhudl1980@163.com (Dongliang Zhu)

ABSTRACT: In this paper, a novel soft-templating coupled with one-pot hydrothermal method has been developed to prepare magnetic ordered mesoporous carbon (Fe₃O₄-OMC) by using hexamine and resorcinol as the carbon source and triblock copolymer F127 as a template. Prepared Fe₃O₄-OMC possesses a large number of long and ordered mesoporous pore structures, the Fe₃O₄ nanoparticles were well embedded in the mesoporous carbon walls, and has a strong magnetization value of 39 emu g⁻¹ and a narrow mesopore size distribution that peaked at 3.8 nm. The ordered channel of the Fe₃O₄-OMC is highly influenced by the quantity of Fe₃O₄ nanoparticles, hydrothermal reaction time and carbonization temperature.

Keywords: Carbon materials, nanocomposites, ordered mesoporous, superparamagnetic, soft-templating, hydrothermal method

1. Introduction

Magnetic ordered mesoporous carbon (MOMC) materials were given great attention due to their unique pore structure (2-50 nm), high surface area and high adsorption capacity, excellent biocompatibility, chemical and thermal stability, and non-toxic side effects [1-2]. Until now, various kinds methods for the synthesis of MOMC have been reported, main including the hard-template and soft-template methods [3]. Conventional

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