Synthesis and characterization of nanoporous silica film via non-surfactant template sol-gel technique

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Abstract

Nanoporous silicon dioxide has received growing interests owing to their peculiar application potentials in conservation and storage energy. Therefore, the development of novel and simple techniques is required for raising these nanoporous materials to industrial level. In this research, we report novel strategy for the synthesis of nanoporous SiO2 via non-surfactant template sol-gel technique for the first time. The morphology and structure of the as prepared and annealed nanoporous silica films were studied using X-ray diffraction, scanning electron microscope. Fourier transform infrared spectroscopy and nitrogen absorption/desorption technique. The results showed that highly order nanoporous silica film has been obtained at annealing temperature 600 degrees C with average diameter 5.1 nm and average pore volume 3.6 cm(3) g(-1). (C) 2012 Elsevier Ltd. All rights reserved.

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