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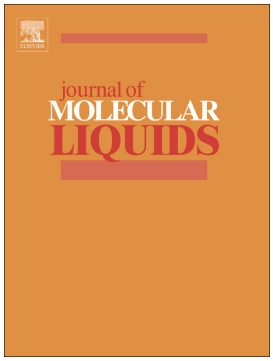

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Synthesis of hexagonal shaped nanoporous carbon for efficient adsorption of methyl orange dye

Sukanya Kundu, Ipsita Hazra Chowdhury, Milan Kanti Naskar*

Sol-Gel Division, CSIR-Central Glass and Ceramic Research Institute, Kolkata 700 032, India

Abstract

Hexagonal shaped nanoporous carbon was synthesized using phenol and formaldehyde in the presence of triblock co-polymer P123 as soft template under hydrothermal reaction at 130^{o}C/24 h, followed by calcination at 700^{o}C for 3h under N_2 atmosphere. The N_2 adsorption-desorption study revealed the BET surface area of 814 m^2g^{-1} containing micropores and mesoporoes. The hexagonal morphology of the product of size 100-400 nm was revealed by FESEM and TEM. The uniform mesopore arrangement of the particles was confirmed by TEM. For adsorption study with methyl orange (MO), a water contaminant dye, the effect of contact time, adsorbate concentration and temperature on the adsorption capacity of the synthesized product was investigated. The prepared nanoporous carbon showed around 100% of MO adsorption within 20 min with maximum adsorption capacity up to 18.8 mg g^{-1}.

Keywords: Hexagonal Carbon; Textural property; Dye; Adsorption.

*Corresponding author: Ph: +91 33 2473 3496 (Ext. 3516), E-mail: milan@cgcri.res.in

1.0 Introduction

Porous carbonaceous materials are universally essential in different areas of modern science and technology in the fields of electronics [1] environment [2], energy [3] catalysis [4] etc. The wide-spread applications of nanoporous carbons result due to their remarkable properties such as high surface area, high porosity, adsorption capacity, and excellent thermo-chemical stability. Porous carbon materials can be synthesized through different ways, such

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