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Short Communication

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Duu-Jong Lee, Ya-Ling Cheng, Ruei-Jyun Wong, Xiao-Dong Wang

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Adsorption removal of natural organic matters in waters using biochar

Duu-Jong Lee[*1,2], Ya-Ling Cheng[1], Ruei-Jyun Wong[1], Xiao-Dong Wang[3,4]
[1]Department of Chemical Engineering, National Taiwan University, Taipei, Taiwan 10617; [2]Department of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan 10607; [3]Research Center of Engineering Thermophysics, North China Electric Power University, Beijing 102206, China; [4]School of Energy Power and Mechanical Engineering, North China Electric Power University, Beijing 102206, China
[*]Corresponding author: Tel: +886-2-33663028; Fax: +886-2-23623040; Email: djlee@ntu.edu.tw

Abstract

This work concerns the adsorption of aromatic organic matter from river water using various doses of a simulated biochar. The water yielded five UV_{254} peaks associated with organic matters in size exclusion chromatography (SEC), corresponding to molecular weights (MW) of 10000, 6500, 4800, 3000, and 1500 Da. Biochar removes all of these peaks with an overall adsorption of 6.4 mg-DOC/g-C, and preferentially removes organic matter with high MW. Physisorption control in a pseudo-second-order type model fits the adsorption kinetics. Biochar can therefore be used as an efficient adsorbent of organic matter in water.

Keywords: aromatic organic matters; molecular weights; adsorption; biochar

1. INTRODUCTION

The removal of organic matter from waters is a critical process at waterworks for minimizing odor and the formation of toxic side products of chlorination disinfection process (Ivancev-Tumbus 2014). Lee *et al.* (2013) compared the forms of dissolved organic matter from 18 waterworks in eight countries and identified humin-like, protein-like, or mixed organic matter in their water streams. Relatively cheap enhanced coagulation is often utilized to remove organic matter with a molecular weight of greater than 6,500 Da (Cheng *et al.*, 2010a, 2010b). Other processes for