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APPLICATION OF WOOD WASTE FOR REMOVAL OF REACTIVE BLUE 19 FROM AQUEOUS SOLUTIONS: OPTIMIZATION THROUGH RESPONSE SURFACE METHODOLOGY

Armineh Azizi¹, Mohammad Reza Alavi Moghaddam^{1*}, Mokhtar Arami²

¹Civil and Environmental Engineering Department,

²Textile Engineering Department

Amirkabir University of Technology (AUT), Hafez Str., 15875-4413 Tehran, Iran

Abstract

The aim of this study is to employ the response surface methodology (RSM) for optimizing three operating variables of adsorption process for the removal of reactive blue 19 (RB19) dye using wood waste (WW) of Mazandaran wood and paper industries (MWPI). For the maximum dye removal efficiency (100%), optimum conditions were obtained at initial pH of 1.72, adsorbent dose of 13.36 g/L and initial dye concentration of 65.91 mg/L with RSM program. Under these experimental conditions, the dye removal efficiency and q (the amount of removed dye per unit mass of adsorbent) were observed 96.38% and 4.75 mg/g, respectively which confirms close to RSM results. According to the ANOVA results, the model presents high R^2 -value of 99.3% for RB19 dye removal using wood waste. For the real textile wastewater containing RB 19 dye, the dye removal efficiency and q were obtained 87.73% and 32.78 mg/g, respectively. The maximum desorption efficiency of the dye loaded adsorbent was obtained 58.69% using alkaline solution (pH of 12.4) under the optimum conditions of RSM results.

Key words: adsorption, desorption, reactive blue 19, response surface methodology, wood waste

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* Author to whom all correspondence should be addressed: e-mail: alavim@yahoo.com; Phone: 0098-912-2334600; Fax: 0098-2166414213