Use of grape pomace as a biosorbent for the removal of the Brown KROM KGT dye

Ana Paula de Oliveira, Aparecido Nivaldo Módenes, Maria Eduarda Bragião, Camila L. Hinterholz, Daniela E.G. Trigueros, Isabella G. de O. Bezerra

PII: S2589-014X(18)30035-5
DOI: doi:10.1016/j.biteb.2018.05.001
Reference: BITEB 33

To appear in:

Received date: 19 March 2018
Revised date: 2 May 2018
Accepted date: 2 May 2018

Please cite this article as: Ana Paula de Oliveira, Aparecido Nivaldo Módenes, Maria Eduarda Bragião, Camila L. Hinterholz, Daniela E.G. Trigueros, Isabella G. de O. Bezerra , Use of grape pomace as a biosorbent for the removal of the Brown KROM KGT dye. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Biteb(2017), doi:10.1016/j.biteb.2018.05.001

Use of grape pomace as a biosorbent for the removal of the Brown KROM KGT dye

Ana Paula de Oliveira[2*], Aparecido Nivaldo Módenes[1], Maria Eduarda Bragião[1], Camila L. Hinterholz[1], Daniela E. G. Trigueros[1], Isabella G. de O. Bezerra[1]

[1]Postgraduate Program of Chemical Engineering, West Paraná State University, Rua da Faculdade 645, Jd. Santa Maria, 85903-000, Toledo, PR, Brazil, e-mail: anmodenes@yahoo.com.br.

[2*]Academic Department of Chemical Engineering (DAENQ), Federal University of Technology - Paraná (UTFPR), Linha Santa Bárbara, s/nº, CEP: 85601-971, Francisco Beltrão-PR, Brazil, e-mail: anapoliveira@utfpr.edu.br.

ABSTRACT

In this paper, the removal capacity of grape pomace was evaluated removing the KROM Brown KGT dye. Initially, batch adsorption tests were conducted to evaluate the operating parameters, which indicated 2.0 as initial pH, particle size between 0.14-1.4 mm and temperature of 25 °C, for initial dye concentration of 100 mg L^{-1}. Based on these operating conditions, kinetic and adsorption equilibrium data were obtained. The resulting equilibrium time was 12 hours. The kinetic model of pseudo first order was the one that best represented the experimental data. The adsorption equilibrium data suggest a process of monolayers, according to the Langmuir model, with a maximum biosorption capacity of 180.2 ± 3.2 mg g^{-1}. The thermodynamic data suggest a thermodynamically favorable and exothermic process.