

Calorimetric Study on Four Activated Carbons Obtained from Waste Tires for the Adsorption of Triton X-100

Aida Mireya Ramírez Arias^{1*}, Juan Carlos Moreno-Piraján¹, Liliana Giraldo²

¹ Departamento de Química, Universidad de los Andes, Bogotá, Colombia

² Departamento de Química, Universidad Nacional de Colombia, Bogotá, Colombia

* E-mail: am.ramirez12@uniandes.edu.co

Keywords: Activated Carbon, Triton X-100, Wastetire, Immersion calorimetry

In recent years there has been a worldwide increase in tire waste, where World Cities generate about 1.3 billion tonnes of tire waste per year. This volume is expected to increase to 2.2 billion tonnes by 2025 (Passaponti et al. 2019; Pedram et al. 2016), and much of it ends up in sidewalks, wetlands, parks, and separators, causing health problems. One solution could be to use these waste tires as a resource to produce activated carbon, which can then be used to remove Triton X-100 from waterways.

Four activated carbons were obtained from waste tires with a particle size of 0.3mm. These carbons were obtained by chemical impregnation with potassium hydroxide, using two concentrations of impregnating agent and two carbonization temperatures. The activated carbons obtained were characterized by: physisorption with nitrogen, elemental analysis, infrared spectroscopy, elemental analysis, scanning electron microscopy, and Boehm titration. Finally, the four activated carbons were studied with immersion calorimetry where the effect of the impregnation agent concentration, the concentration of Triton X-100, and the carbonization temperature in the immersion enthalpy was studied.

Acknowledgments

Authors thank the Faculty of Ciencias of Universidad de los Andes for the financing of the project INV-2018-48-1391

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