



A Comparative Study for Attenuation of Residual Free Chlorine by Mesoporous Adsorbent from Scrap Tire Rubber and Commercial Activated Carbon

¹Yasameen T. Yousif, ²Dina A. Yaseen, ³Saad Abu-Alhail

¹*Assistant Lecturer, Department of Civil Engineering, College of Engineering, Unioversity of Basrah, Basra, Iraq.*

E-mail: yasameen.yousif@uobasrah.edu.iq.

²*Lecturer, Department of Civil Engineering, College of Engineering, Unioversity of Basrah, Basra, Iraq.*

E-mail: dina.yaseen@uobasrah.edu.iq.

³*Assistant Professor, Department of Civil Engineering, College of Engineering, Unioversity of Basrah, Basra, Iraq.*

E-mail: saad.arab@uobasrah.edu.iq.

Abstract

In this study, a series of experiments was performed for assessing and comparing the potential of two types of activated carbon for adsorbing free-residual chlorine (FRCL) from aqueous mixture. The first type was prepared from waste tire rubber (WTRAC) and the second one was commercially available (CAC). The impact of different operational factors such as contact time, preliminary concentration of free chlorine, dose and particle size of the active carbon on the free chlorine removal are also studied. To describe the sorption kinetics and equilibrium in the liquid-solid phase, the experimental data were adjusted with pseudo first-order, pseudo second-order, and intra-particle diffusion models, and with the Langmuir, Freundlich, and Temkin sorption isotherms. Results showed that WTRAC is an excellent and cheap material for free-residual chlorine reduction (78%), and it is outperformed the adsorption capacity of CAC (64%). The optimum time for higher FRCL

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