Optimization Study for removal of Heavy Metals from Aqueous Solution Onto Activated Carbone Prepared from olives seeds

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ABSTRACT:

Mesopours activated carbon prepared from Iraqi olives seeds (OS) using physical activation by carbon dioxide gasification. The effects of the activation temperature and activation time on the carbon yield and phenolic compounds removal were investigated. From the analysis of variance (ANOVA), the most influential factor on each experimental design response was identified. The optimum conditions for preparing nano activated carbon from Iraqi olives seeds were found: activation temperature of 500 ^{o}C and activation time of 60 min. The carbon yield was found to be 18.5% while the removal of Cu, Zn and CD were found to be 90, 91 and 88.0% respectively.

The nano activated carbon prepared for the removal of phenolic compounds from aqueous solution by the adsorption process was found to contain, in general, large pore sizes. The higher activation temperature and carbon dioxide gasification applied is believed to be responsible for activated carbon characteristics which gave better outputs at least when compare to those being used commercially. However, the high surface areas and total pore volumes of the prepared activated carbon were believed to be due to the method of the activation process employed in this work which was a combination of both heating and physical activating agents of CO_2. Pore development during the carbonization process is an important step because it enhances the surface areas and pore volumes of the activated carbon by promoting the diffusion of CO_2 moles into the pores thus increasing the CO_2-C reactions; a process responsible for generating more pores in the activated carbon.

Keywords: Activated carbon; Adsorption; Olive's seeds; Optimization; Heavy metals.