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INVESTIGATION OF ABSORPTION OF HEAVY METALS AND POLLUTING MINERAL COMPOUNDS BY CARBON NANOPARTICLES PRODUCED FROM POMEGRANATE PEEL, AS WELL AS ELEMENTS EFFECTIVE ON IT

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ABSTRACT

Existence of chemical pollutions and heavy metals in the environment, especially in surface and ground waters is followed by enormously harmful effects on public health. For the purpose of elimination of these pollutions, several methods including implementation of CNTs and active carbons yielding from agricultural wastes have been used. Considering the industrial variability of the city of Saveh, every year a large amount of polluting chemical wastewater enters the environment. The purpose of the present study was to eliminate the Nickel heavy metal and pollutions caused by mineral compounds through making use of pomegranate peel wastes for production of active carbons. For this purpose, various parameters such as pH, contact time, absorber amount, primary density of the metal, and Freundlich and Langmuir's adsorption isotherms, as well as the overall experiment scheme were studied and investigated using the Design Expert Software. Results of the study showed that a pH of 8 is associated with the highest absorption level. In addition it was tuned out that by prolonging the contact time up to 50 minutes, more than 84.2% of the Nickel content is absorbed by the absorber. The obtained experimental data are in a roughly desirable consistence with the Freundlich and Langmuir's isotherm models. The values yielded by the optimization of factors were evaluated in order to obtain an optimum elimination efficiency solution and a high selectivity percentage. In order to obtain the selectivity of 0.691 and the optimum elimination efficiency of 91.7432, the value of pH must be equal to 8, contact time must be 50 minutes, and the primary density must be 75mgs per liter.

Key words: nickel, optimum elimination efficiency, pomegranate peel wastes