Nitrate Absorption From Aqueous Solution by Using Sugrance Bagasse Biochar, Broken Ceramic, Cocopeat adsorbent

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Abstract

In recent years, the use of Biochar has been considered to remove pollutants such as Nitrate. Due to the increase in Nitrate concentration in Water Sources and the biological consequences resulting from it, in this research, the efficiecny of Three adsorbants Sugarcane Bagasse Biochar, Broken Ceramic, Cocopeat was investigate in Nitrate absorption an aqueous solution. In this research, which done at laboratory of shahid chamran university of Ahvaz in 2020, the response surface method based on the Box-Behnken design, has been used to evaluate the effect of independent variables of pH, Temperature, amount of absorbent on the response performance. Also, the adsorption kinetics and adsorption Isotherms, were investigated in the three types of adsorbents SEM, XRD, CHNSO and FTIR Studied, in order to investigate the chemical structure of the Sugarcane Bagasse Biochar box adsorbent. the adsorbent was analyzed. The results showed that, by increasing the amount of adsorbent and contact time, the amount of Nitrate removal increased, while by increasing pH the initial concentration of Nitrate, its removal efficiency decreased. Also, all Three types of adsorbents studied in the isotherm models, were more consistent with the Langmuir isotherm model. By comparing the coefficients of determination in Two Kinetic models of the First order and pseudo-second order. The adsorption process was better described with the pseudo- second-order Kinetic model. Finally, the maximum removal percentage was calculated and the values predicted the Box-Behnken model for removal by Sugarcane Bagasse Biochar was 69.7%, Broken Ceramic was 39.4% and Cocopeat was 25.1%. the result of it shows that, more Nitrate is absorbed by Sugarcane Bagasse Biochar box is better than the other Two absorbents.

Keywords: Nitrate Removal, Sugrance Bagasse Biochar, Broken Ceramic, Cocopeat.

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