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Comparative Study of Sorption of Cr Ions and Dye Bezaktiv Yellow HE-4G with the Use of Adsorbents Natural Mixture of Olive Stone and Date Pits from Aqueous Solution

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Abstract : In this paper, a comparative study of the adsorption of Chromium and dyes, onto mixture biosorbents, olive stones and date pits at different percentage was investigated in aqueous solution. The study of various parameters: Effect of contact time, pH, temperature and initial concentration shows that these materials possess a high affinity for the adsorption of chromium for the adsorption of dye bezaktiv yellow HE-4G. To deepen the comparative study of the adsorption of chromium and dye with the use of different blends of olive stones and date pits, the following models are studied: Langmuir, Freundlich isotherms and Dubinin- Radushkvich (D-R) were used as the adsorption equilibrium data model. Langmuir isotherm model was the most suitable for the adsorption of the dye bezaktiv HE-4G and the D-R model is most suitable for adsorption Chrome. The pseudo-first-order model, pseudo-second order and intraparticle diffusion were used to describe the adsorption kinetics. The apparent activation energy was found to be less than 8KJ/mol, which is characteristic of a controlled chemical reaction for the adsorption of two materials. t was noticed that adsorption of chromium and dye BEZAKTIV HE-YELLOW 4G follows the kinetics of the pseudo second order. The study of the effect of temperature was quantified by calculating various thermodynamic parameters such as Gibbs free energy, enthalpy and entropy changes. The resulting thermodynamic parameters indicate the endothermic nature of the adsorption of Cr (VI) ions and the dye Bezaktiv HE-4G. But these materials are very good adsorbents, as they represent a low cost. in addition, it has been noticed that the greater the quantity of olive stone in the mixture increases, the adsorption ability of the dye or chromium increases.

Keywords : chromium ions, anions dye, sorption, mixed adsorbents, olive stone, date pits
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