

عنوان مقاله:

Adsorption of Malachite Green from Aqueous Solution using Activated Ntezi Clay: Optimization, Isotherm and Kinetic Studies

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خلاصه مقاله:

The adsorption of malachite green from aqueous solution using a local low cost adsorbent, acid activated Ntezi clay, was investigated. The low cost adsorbent was activated with different concentrations of sulphuric acid and the physicochemical properties of the adsorbent were determined. The structural properties were also analyzed using XRF and XRD. The adsorption process was studied as a function of different process parameters such as temperature, adsorbent dosage, contact time, particle size and stirring speed. These process parameters were optimized using response surface methodology (RSM). The significance of the different process parameters and their combined effect on the adsorption efficiency has been established through a full factorial central composite design. The equilibrium modeling was analyzed using Langmuir, Freundlich, Dubini-Radushkevich and Temkin isotherm equations. The experimental results follow the Langmuir adsorption isotherm. Adsorption kinetics follows the pseudo-second order equation with intra-particle diffusion as the rate-determining step. This investigation has shown that local mineral clay can be modified and used as a good adsorbent for removal of impurities from contaminated water

کلمات کلیدی:

Adsorption, Equilibrium, Kinetics, Isotherm, Optimization, Malachite green, Clay

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