

Adsorption kinetics of nitrate ions on activated carbons

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Abstract:

The development of effective processes and specific activated carbon that can reduce nitrate ions in aqueous medium has attracted much attention recently. Nitrate ion pollution is a major problem to the environment since it can lead to water eutrophication and also for the health because it can cause diseases such as cancer, infant methemoglobinemia, and damages to nervous tissue and cognitive functions. Activated carbons synthesized from biomass wastes are recognized as being the cheapest and most effective materials. They are efficiently used for the removal of pollutants.

In this work, the adsorption kinetic and adsorption capacity of nitrate ions on activated carbons are studied. To better understand the adsorption mechanism, activated carbons having different acidic and/or basic functional groups and different types of porosity (micro-and/or mesoporosity) were selected. The influence of various parameters, such as the pH and temperature of the nitrate solution, the nitrate initial concentration, the carbon adsorbent amount,... on the adsorption kinetic of nitrate ions were investigated. To model the nitrate adsorption, Ho and Mc Kay kinetic model and Langmuir model were used.

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