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Optimization of nitrate removal process from aqueous solution by Clinoptilolite zeolite using surface response method

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Abstract

Nitrate is one of the most important pollutants in nature, which is considered a serious threat to human health and the quality of water resources. One of the methods to remove this pollutant is the use of modified adsorbents such as oxide nanoparticles on clinoptilolite zeolite[1].

In this study, the samples were prepared synthetically at a concentration of 100 mg/liter of nitrate. The independent variables included the amount of adsorbent in g/L, the percentage of copper oxide loaded, and pH. The performance of the process was evaluated based on the nitrate removal percentage. Determining the number of tests, statistical analysis of laboratory data and optimization of nitrate removal efficiency were done by using response surface method and central compound design.

The results showed that pH, the percentage of copper oxide loaded, pH, the square of the percentage of copper oxide loaded were the most important parameters affecting nitrate removal by this method.

Keywords: Clinoptilolite zeolite, copper oxide nanoparticles, surface response method, central composite design, optimization

References

[1]Rezaee, A., Godini, H., Jorfi, S., *Environmetal engineering and management Journal*. **2010,**9(3):449-52.