Research Article

Adsorption of BTEX on Surfactant Modified Granulated Natural Zeolite Nanoparticles: Parameters Optimizing by Applying Taguchi Experimental Design Method

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Adsorption; BTEX; Granulated nanozeolite; Optimization; Surfactant-modified adsorbents; Taguchi method

Abstract

In this paper a novel adsorbent developed by means of granulating of natural zeolite nanoparticles (i.e., clinoptilolite) was evaluated for possible
Studies were conducted using a Taguchi statistical approach. The results ascertained that initial pH of the solution was the most effective parameter. However, the low pH (acidic) was favorable for BTEX adsorption onto the developed adsorbents. In this study, the experimental parameters were optimized and the best adsorption condition by determination of effective factors was chosen. Based on the SN ratio, the optimized conditions for BTEX removal were temperature of 40°C, initial pH of 3, TDS of 0 mg/L, and MTBE concentration of 100 μg/L. Under the optimized conditions, the uptake of each BTEX compounds reached to more than 1.5 mg/g of adsorbents.


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