



Effects of loading rate, resin height, and bed volume on nitrate removal from drinking water by non-selective strong anion exchange resin (A400E)

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ABSTRACT

The aim of this study was to compare the performance of down- and up-flow non-selective strong anion exchange resin (A400E) in the removal of nitrate from drinking water due to loading rate, height and volume of resin, as well as passing water volume. In this study, totally, 270 samples were taken and analyzed for evaluating the amount of outcome nitrate. The results showed that the trend of removing nitrate decreased in terms of increasing the passing water volume and loading rate in both systems. While the altitude of ion-exchange column increased due to the up-flow, the removal efficiency of nitrate increased continuously. In the down-flow resin, the efficiency of the system was gradually reduced while increasing the height of resin up to 60 cm; whereas the system efficiency increased at the resin height of 60–90 cm. The efficiency of both ion-exchange systems were affected as a result of the some factors including volume of passing water, resin height, and loading rate at high, medium, and low levels, respectively. Overall, to achieve the sufficient water quality, it is required to consider the height of resin and amount of passing water volume to reach the cost and effectiveness of the system.

Keywords: Ion-exchange system; Up-flow; Down-flow; Groundwater contamination; Nitrate removal

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