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ACCEPTED MANUSCRIPT

Kinetic and equilibrium modelling of MTBE (Methyl tert-butyl ether) adsorption on ZSM-5 zeolite: Batch and column studies

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Highlights

(1) The adsorption process of MTBE on ZSM-5 was explored with batch and column tests.

(2) The adsorption follows the Langmuir model and obeys a pseudo-second-order model.

(3) Pore diffusion is the main rate-limiting step for the entire adsorption process.

(4) pH has little effect, while nickel ions suppress the adsorption process.

(5) The removal capacity is ~18.71 $mg \cdot g^{-1}$ in fixed-bed column tests.

Abstract

The intensive use of methyl tert-butyl ether (MTBE) as a gasoline additive has resulted in serious environmental problems due to its high solubility, volatility and recalcitrance. The feasibility of permeable reactive barriers (PRBs) with ZSM-5 type zeolite as a reactive medium was explored for MTBE contaminated groundwater remediation. Batch adsorption

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