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## AMMONIUM IONS REMOVAL FROM AQUEOUS SOLUTIONS USING MESOPOROUS (Al)Si-MCM-41

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### Abstract

The batch removal of ammonium ions from aqueous solutions under different experimental conditions using (Al)Si-MCM-41 mesoporous molecular sieve in comparison with LTA microporous zeolite was investigated in this study. The ammonium uptake was dependent on the initial ammonium concentration. The equilibrium sorption data were fitted using Freundlich and Langmuir isotherm models. The Langmuir model (monolayer sorption) gave the best fit ( $R^2 = 0.9965$  for (Al)Si-MCM-41 and  $R^2 = 0.9995$  for LTA). The saturation capacity (monolayer coverage) was found of 33.33 mg  $\text{NH}_4^+$ /g (Al)Si-MCM-41 and 55.55 mg  $\text{NH}_4^+$ /g LTA. Equilibrium sorption was reached at about 25 min on (Al)Si-MCM-41 and at about 60-90 min in the case of LTA molecular sieves. The kinetic data showed that the sorption rate could be better described by pseudo-second order model.

*Key words:* ammonium, kinetics, LTA, mesoporous aluminosilicate MCM-41, sorption isotherms

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