

Equilibrium study of aluminium sorption from phosphoric acid solutions onto Tunisian natural raw clays

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Abstract

This study summarizes a fundamental investigation on the removal of aluminium ions from phosphoric acid solutions onto three kind of natural raw clays issued from different Tunisian deposit's. Equilibrium removal isotherms were measured for the three clays used. The influence of some experimental parameters such as time contact and initial concentration of phosphoric acid solutions was studied. The clays used in this study were effective for aluminium elimination, the optimum initial concentration of phosphoric acid was found to be molar and one hour of contact time was very sufficient to reach equilibrium. The experimental data of the removal equilibrium were correlated by either the Langmuir or Freundlich equations. Results indicated that the Freundlich model gave a better fit to the experimental data than the Langmuir equation for the different clays. The results of the experiments suggest that the highest degree of acid purification was achieved in the first five minutes of the present batch process with an equilibrium removal rate of 82 % and a maximum adsorption capacity of 145.66 mg/g by the Gafsa raw clay.



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