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ADSORPTION OF PHOSPHATE FROM AQUEOUS SOLUTIONS BY THERMALLY MODIFIED Palygorskite

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Abstract

In this study, palygorskite clay calcinated at different temperatures from 200 to 900 °C was used as adsorbent to remove phosphate from aqueous solutions. The crystal structure and the surface property of the thermally modified material was investigated to determinate the relationship between the adsorption capacity of the adsorbent and the changes of the crystal structure and surface property. The results indicate that palygorskite clay calcinated at 700 °C had the highest adsorption capacity. Complete dehydroxylation destroyed the crystal structure and Al coordination was changed from octahedral to tetrahedral and further to a small amount of penta-coordination. The thermally modified adsorbent material was amorphous. All these structure changes enhanced the activity of Al and phosphate adsorption.

Key words: adsorption, palygorskite, phosphate, thermal treatment

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