Adsorption of Phosphate Ion in Water with Lithium-Intercalated Gibbsite

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Abstrak

In order to enhance adsorption capacity of gibbsite (Al(OH)3 as an adsorbent for the adsorption of phosphate in water, gibbsite was modified through lithium-intercalation. The purification method of Tributh and Lagaly was applied prior to intercalation. The Li-Intercalation was prepared by the dispersion of gibbsite into LiCl solution for 24 hours. This intercalation formed an cationic clay with the structure of [LiAl2(OH)6]+ and exchangeable Cl- anions in the gibbsite interlayer. A phosphate adsorption test using Lithium-intercalated gibbsite (LIG) resulted in optimum adsorption occurring at pH 4.5 with an adsorption capacity of 11.198 mg phosphate/g LIG which is equivalent with 1.04 wt% LIG. The adsorption capacity decreased with decreasing amounts of H2PO4-/HPO4- species in the solution. This study showed that LIG has potential as an adsorbent for phosphate in an aqueous solution with pH 4.5?9.5.