

Adsorption of Cadmium(II) Using Ca/Al Layered Double Hydroxides Intercalated with Keggin Ion

Publons ID	31994664
Wos ID	WOS:000511103900007
Doi	10.22146/IJC.36447
Title	Adsorption of Cadmium(II) Using Ca/Al Layered Double Hydroxides Intercalated with Keggin Ion
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Publish Date	NOV 2019
Journal Name	Indonesian Journal of Chemistry
Citation	8
Abstract	<p>Ca/Al layered double hydroxides (Ca/Al LDH) was synthesized using coprecipitation method following calcination at 800 degrees C and was intercalated with Keggin ion $[\alpha\text{-SiW}_{12}\text{O}_{40}]^{4-}$ to form intercalated Ca/Al LDH. Materials were characterized using XRD and FTIR spectrophotometer. Furthermore, materials were used as an adsorbent of cadmium(II) from solution. The results showed that layer material was formed completely after calcination which was indicated at diffraction 20 degrees due to loss of water in the interlayer space. Ca/Al LDH after calcination was intercalated with $[\alpha\text{-SiW}_{12}\text{O}_{40}]^{4-}$ ion and interlayer distance was increased from 4.25 to 4.41 angstrom showed that intercalation process was successfully conducted. Adsorption of cadmium(II) using Ca/Al LDH was conducted at pH 9 and intercalated Ca/Al LDH at pH 8 showed that intercalated material has slightly faster than Ca/Al LDH without intercalation probably due to slightly increasing interlayer distance of Ca/Al LDH after intercalation. The adsorption capacity of intercalated Ca/Al LDH was higher than Ca/Al LDH without intercalation at the temperature range of 30-50 degrees C.</p>
Publish Type	Journal
Publish Year	2019
Page Begin	873
Page End	881
Issn	1411-9420
Eissn	
Url	https://www.webofscience.com/wos/woscc/full-record/WOS:000511103900007
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