

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

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Abstract	Ca/Al layered double hydroxides (Ca/Al LDH) was synthesized using co-precipitation method following calcination at 800 °C and was intercalated with Keggin ion $[SiW_{12}O_{40}]^{4-}$ 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° due to loss of water in the interlayer space. Ca/Al LDH after calcination was intercalated with $[SiW_{12}O_{40}]^{4-}$ ion and interlayer distance was increased from 4.25 to 4.41 Å... 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 °C.
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