

Preparation of Adsorbent with High Performance for Nitrate from Bittern

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Summary

Nitrate contamination of surface and groundwater is one of the main problems associated with agricultural activities in many part of the world, and there is an urgent need to develop effective materials and process for efficiently removing excess nitrate from aquatic environment. On the other hands, bittern is one of the resources from seawater to be desired for a new utilization.

In this study, we attempted to prepare the adsorbent with high removal performance for nitrate from bittern. The product including Fe-layered double hydroxide was synthesized from bittern with addition of cheap agent, FeCl_3 .

Fe-layered double hydroxide can be synthesized from bittern with addition of FeCl_3 , and the product from the bittern has removal ability for nitrate ion. The equilibrium adsorption capacity of the product for nitrate were measured and extrapolated using Langmuir and Freundlich isotherm models, and experimental data are found to fit Freundlich than Langmuir. The calculated maximum adsorption capacity for nitrate is 0.32 - 0.47 mmol/g. Adsorption of nitrate increase within 30 min and then gradually decrease, due to the ion exchange reaction of Fe-layered double hydroxide.