

New Process for 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 develop a new process for preparation of the adsorbent with high removal performance for nitrate from bittern with addition of cheap agent, FeCl_3 .

Mg-Ca-Fe-layered double hydroxide (LDH) can be synthesized from bittern with addition of FeCl_3 , and the products synthesized in the solution at lower pH (8.5-9.5) contains higher Mg in the form of Mg-Fe LDH than those synthesized in the solution at higher pH (10.5-12.5) in the form of Mg-Ca-Fe LDH. In addition, the product synthesized at 50°C contains higher Mg than those at 20°C and 80°C. The product has the removal ability for nitrate ion, and the product including high amount of Mg-Fe LDH indicates effective and selective removal of nitrate ion.