



## 论文摘要

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## 铬铝基柱撑蒙脱石的制备与孔道结构

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**摘要:**以钠基蒙脱石为原料, 采用取代法合成铬铝柱化剂, 并用湿法工艺制备铬铝基柱撑蒙脱石, 研究不同Cr与Al物质的量比和pH对柱撑蒙脱石制备的影响。研究表明: 当Cr离子与Al离子物质的量比为21:1、加入100 mL浓度为0.4 mol/L NaOH时, 可得到(001)层间距达2.053 5 nm的铬铝基柱撑蒙脱石, 铬铝二元聚合羟基阳离子与钠基蒙脱石之间发生离子交换反应, 进入膨胀的蒙脱石层间; 铬铝柱撑蒙脱石的基本结构在离子交换过程中并没有发生改变, 且发现铬氧八面体, 但未发现铬氧四面体, 铬离子倾向于以铬氧八面体的形式进入铬铝基柱撑蒙脱石层间; 铬铝基柱撑蒙脱石的比表面积为170.4 m<sup>2</sup>/g, 孔容为0.184 1 cm<sup>3</sup>/g, 介孔平均孔径为3.840 nm, 说明铬铝基柱撑蒙脱石比钠基柱撑蒙脱石、铝基柱撑蒙脱石和铬基柱撑蒙脱石具有较大的比表面积、较大的微孔和较小的介孔, 铬铝柱撑蒙脱石是一种有用的催化和吸附材料。

**关键字:** 钠基蒙脱石; 铬铝基蒙脱石; 柱撑

## Preparation and channel structure of Al-Cr-pillared montmorillonite

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**Abstract:** Na-montmorillonite was used as starting material to obtain Al-Cr-montmorillonite. Al-Cr-pillared agent was synthesized by ion-exchange method and Al-Cr-montmorillonite was prepared with wet technology. The effects of molar ratio of Cr ion to Al ion and pH value on Al-Cr-montmorillonite were investigated. The results show that the (001) basal spacing of Al-Cr-montmorillonite reaches 2.053 5 nm when Al-Cr-montmorillonite is synthesized under the condition of 21:1 molar ratio of Cr ion to Al ion and 100 mL 0.4 mol/L NaOH, the Cr-Al polyoxocations insert into the montmorillonite. The basic structure of montmorillonite remains unchanged, (Cr—O)<sub>Oh</sub> is detectable and (Cr—O)<sub>Td</sub> band is not found, and Cr<sup>3+</sup> tends to adopt octahedral coordination instead of tetrahedral to enter into the layers of montmorillonite. The specific area, average mesopore diameter and pore volume of Al-Cr-montmorillonite are 170.4 m<sup>2</sup>/g, 3.840 nm and 0.184 1 cm<sup>3</sup>/g, respectively. Al-Cr-montmorillonite has larger specific area, relatively larger micropore diameter and smaller mesopore diameter which is a useful adsorption and catalysis material.

**Key words:** Na-montmorillonite; Al-Cr-montmorillonite; pillaring

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