

高岭土 / 羧甲基淀粉复合颗粒的制备及其协同电流变效应

王宝祥, 李佳, 赵晓鹏

西北工业大学电流变技术研究所141#信箱

收稿日期 修回日期 网络版发布日期 接受日期

摘要 通过二次插层取代法, 以二甲基亚砷为前驱体, 羧甲基淀粉二次插层取代制备了高岭土/羧甲基淀粉纳米复合材料。结合XRD, FTIR, SEM和EDS等测试手段对复合材料的结构进行了表征。研究发现, 羧甲基淀粉经过二次插层取代引起了高岭土片层之间的剥离, 形成剥离型纳米复合材料。该复合材料制备成电流变液出现了较大的协同效应, 具有很好的电流变行为, 并发现电流变性能与复合物中羧甲基淀粉的含量有密切关系。

关键词 [高岭石](#) [淀粉](#) [纳米相材料](#) [复合材料](#) [二甲基亚砷](#) [X射线衍射分析](#) [傅里叶变换红外分光光度法](#) [扫描电子显微镜](#) [协同效应](#)

分类号 [TB323](#)

Preparation and Synergetic Electrorheological Effects of Kaolinite/Carboxymethyl Starch Nanocomposite

Wang Baoxiang, Li Jia, Zhao Xiaopeng

Institute of Electrorheological Technology, Northwestern Polytechnical University

Abstract In this paper, kaolinite/DMSO intercalate was used as precursor, and then carboxymethyl starch (CMS) was introduced by two-step intercalation to prepare kaolinite/CMS nanocomposite. According to the analysis of XRD, FTIR, SEM and EDS, it can be seen that the layers of kaolinite were exfoliated by the intercalation of carboxymethyl starch and the layers dispersed into the carboxymethyl starch. Kaolinite/CMS exfoliated nanocomposite obviously improves its electrorheological activity at direct current electric field. With the component ratio of the nanocomposite closing to 1:1, a strong synergetic effect occurs and the optimum electrorheological effect can be attained. Furthermore, we also find that the electrorheological effect is associated with the content of CMS.

Key words [KAOLINE](#) [STARCH](#) [NANOPHASE MATERIALS](#) [COMPOSITE MATERIALS](#) [DIMETHYLSULFOXIDE](#) [XRD](#) [FT](#) [IR](#) [SEM](#) [COOPERATIVITY](#)

DOI:

通讯作者

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(0KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“高岭石”的相关文章](#)

▶ 本文作者相关文章

· [王宝祥](#)

· [李佳](#)

· [赵晓鹏](#)