

论文

乳液聚合法制备聚苯乙烯/Mg-Al层状双氢氧化物纳米复合材料

张泽江, 梅秀娟, 徐成华, 冯良荣, 邱发礼

中国科学院成都有机化学研究所; 公安部四川消防研究所; 中国科学院成都有机化学研究所 成都 610041 公安部四川消防研究所成都611830中国科学院研究生院北京

收稿日期 2004-4-27 修回日期 2004-7-27 网络版发布日期 接受日期

摘要 采用乳液聚合法制备阻燃性聚苯乙烯MgAl层状双氢氧化物(LDHs)纳米复合材料. 通过对不同合成条件下复合材料的XRD谱, 讨论了纳米复合材料的形成过程; 经SEM图证实了LDHs是以剥离的纳米级层片分散在基体中的; TG和DSC谱图揭示了LDHs纳米层板可有效提高PS的热稳定性, 并可使PS的玻璃化转化温度明显提高; 当层状双氢氧化物在插层复合材料中含量为14.92%时, 纳米复合材料的氧指数可达23.5%, 其用量比在PS中直接添加纳米LDHs时要少约一倍. 文中还分析了纳米复合材料的形成过程.

关键词 [聚苯乙烯](#) [纳米复合材料](#) [层状双氢氧化物](#) [乳液聚合](#)

分类号

POLYSTYRENE/LDHs HYBRID NANOCOMPOSITES PREPARED BY EMULSION POLYMERIZATION

ZHANG Zejiang^{1,2,3}, MEI Xiujuan², XU Chenghua¹, FENG Liangrong¹, QIU Fali¹

1 *Chengdu Institute of Organic Chemistry; Chinese Academy of Sciences; Chengdu 610041*; 2 *Sichuan Fire Research Institute of Public Safety Ministry; Chengdu 611830*; 3 *Graduate School of the Chinese Academy of Sciences; Beijing 100039*

Abstract Polystyrene/Mg-Al layered double hydroxides (LDHs) hybrid nanocomposites were synthesized by emulsion polymerization. The purposed nanocomposites synthesized under different conditions were characterized by the XRD curves. Then the formation conditions of exfoliated PS/LDHs nanocomposites were discussed by the XRD results at low angles. The SEM images were used to observe and analyze the dispersed behavior of the LDHs nanolayers leading to the conclusion that the LDHs nanolayers were exfoliated and well dispersed in these nanocomposites. The thermal stability of these nanocomposites was discussed through the TG and DSC curves. It was found that the LDHs nanolayers can effectively increase the thermal stability of PS. The glass transition temperature of PS can be enhanced and improved by the well dispersed LDHs nanolayers. The limited oxygen index of the PS/LDH nanocomposites prepared by emulsion polymerization was much higher than that of the conventional mixture of PS and nano-LDHs at the same LDH content.

Key words [Polystyrene](#) [Nanocomposites](#) [Layered double hydroxides](#) [Emulsion polymerization](#)

DOI:

通讯作者 邱发礼

扩展功能

本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(582KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [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“聚苯乙烯”的相关文章](#)
- ▶ [本文作者相关文章](#)

- [张泽江](#)
- [梅秀娟](#)
- [徐成华](#)
- [冯良荣](#)
- [邱发礼](#)