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研究论文

用半连续法制备高交联度三维有序聚苯乙烯微球

刘艳辉, 邵忠财, 刘新院, 高景龙

沈阳理工大学材料科学与工程学院 沈阳 110159

摘要: 建立了一种合成高交联度单分散聚苯乙烯的方法--半连续无皂乳液聚合法, 用此法合成的聚苯乙烯交联度可达到50%以上。调整交联剂的加入时间可有效地控制聚苯乙烯粒子的粒度, 制备出高质量高交联度三维有序亚微米级聚苯乙烯微球。揭示了半连续无皂乳液聚合法中合成聚苯乙烯的聚合机理。聚合反应动力学表明: 聚合反应开始后加入交联剂, 可以使聚苯乙烯单体在低转化率情况下快速进入第二成核期。交联剂的加入时间和含量影响聚苯乙烯粒子的粒度、单分散性、球形度和溶解性能。

关键词: 材料合成与加工工艺 半连续法 高交联度 单分散聚苯乙烯

Synthesis of Highly Crosslinked Three - dimensionally Ordered Polystyrene Microspheres by Semi - continuous Method

LIU Yanhui, SHAO Zhongcai, LIU Xinyuan, GAO Jinglong

College of Material Science and Engineering, Shenyang Ligong University, Shenyang 110159

Abstract: Semi - continuous method, by which monodisperse highly crosslinked polystyrene can be synthesized, is presented in this paper. The crosslinking degree of polystyrene synthesized by this method is more than 50%. The average size of the polystyrene can be controlled by adjusting the time of adding cross - linking agent. High - quality and highly crosslinked three - dimensionally ordered polystyrene microspheres can be synthesized. Mechanism of semi - continuous soap - free emulsion polymerization method is investigated. The results show that the secondary nucleation is emerged under low conversion of monomer by delayed divinyl benzene entry. The content of cross - linking agent and the time of adding cross - linking agent affect the average size of the polystyrene, monodispersion properties, shape and solubility.

Keywords: synthesizing and processing technics semi - continuous method highly crosslinked monodisperse polystyrene

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通讯作者: 邵忠财

作者简介:

通讯作者E-mail: zhongcsh@126.com

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