

BIOTECHNOLOGY & BIOENGINEERING

分散聚合合成含有环氧基的无孔超顺磁性微球及其表征

马志军, 官月平, 刘光桥, 刘会洲

State Key Laboratory of Biochemical Engineering, Laboratory of Separation Science and Engineering, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100080, China

收稿日期 修回日期 网络版发布日期 接受日期

摘要 Non-porous superparamagnetic polymer microspheres with epoxy groups were prepared by dispersion polymerization of glycidyl methacrylate (GMA) in the presence of magnetic iron oxide (Fe3O4) nanoparticles coated with oleic acid. The polymerization was carried out in the ethanol/water medium using polyvinylpyrrolidone (PVP) and 2,2'-azobisisobutyronitrile (AIBN) as stabilizer and initiator, respectively. The magnetic microspheres obtained were characterized with scanning electron microscopy (SEM), vibrating sample magnetometry (VSM) and Fourier transform infrared spectroscopy (FTIR). The results showed that the magnetic microspheres had an average size of 1 μm with superparamagnetic characteristics. The saturation magnetization was found to be 4.5emu.g-1. There was abundance of epoxy groups with density of 0.028 mmol.g-1 in microspheres. The magnetic PGMA microspheres have extensive potential uses in magnetic bioseparation and biotechnology.

关键词 超顺磁性, 微球, 环氧基, 分散聚合, 生物技术, 乙基聚合物, 聚苯乙烯

分类号

DOI:

Preparation and Characterization of Non-porous Superparamagnetic Microspheres with Epoxy Groups by Dispersion Polymerization

Ma Zhijun, Guan Yueping, Liu Guangqiao, Liu Huizhou

State Key Laboratory of Biochemical Engineering, Laboratory of Separation Science and Engineering, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100080, China

Received Revised Online Accepted

Abstract Non-porous superparamagnetic polymer microspheres with epoxy groups were prepared by dispersion polymerization of glycidyl methacrylate (GMA) in the presence of magnetic iron oxide (Fe3O4) nanoparticles coated with oleic acid. The polymerization was carried out in the ethanol/water medium using polyvinylpyrrolidone (PVP) and 2,2'-azobisisobutyronitrile (AIBN) as stabilizer and initiator, respectively. The magnetic microspheres obtained were characterized with scanning electron microscopy (SEM), vibrating sample magnetometry (VSM) and Fourier transform infrared spectroscopy (FTIR). The results showed that the magnetic microspheres had an average size of 1 μm with superparamagnetic characteristics. The saturation magnetization was found to be 4.5emu.g-1. There was abundance of epoxy groups with density of 0.028 mmol.g-1 in microspheres. The magnetic PGMA microspheres have extensive potential uses in magnetic bioseparation and biotechnology.

Key words polyglycidyl methacrylate; magnetic polymer microspheres; dispersion polymerization; epoxy groups

通讯作者:

马志军 hzliu@home.ipe.ac.cn

作者个人主页: 马志军; 官月平; 刘光桥; 刘会洲

扩展功能
本文信息
Supporting Info
PDF (1870KB)
HTML全文 (OKB)
参考文献
服务与反馈
全文文档订阅
个人知识库
加入引用管理
引用本文
Email Alert
文章反馈
图表反馈信息
相关信息
本列表中 包含“超顺磁性” 的 相关文献
本文件者相关文章
马志军
官月平
刘光桥
刘会洲