袁亚宏,蔡露阳,岳田利,高振鹏,赵旭博.胺基化磁性壳聚糖微球对苹果渣多酚的吸附条件优化[J].农业工程学报,2012,28(11):279-286

胺基化磁性壳聚糖微球对苹果渣多酚的吸附条件优化

Optimization of adsorption conditions for apple polyphenols by aminated magnetic chitosan microspheres

投稿时间： 2011-09-27 最后修改时间： 2012-04-09

中文关键词：吸附,优化,分离,苹果渣多酚,胺基化磁性壳聚糖微球,反相悬浮法,改性

英文关键词:adsorption optimization separation apple polyphenols aminated magnetic chitosan microspheres inverse suspension cross-linking modification

基金项目:国家自然科学基金项目（31071550，31171721）；农业部“948”项目（2011-G8-3）；陕西省科技攻关（2009K01-20）；西北农林科技大学基本科研业务青年项目（QN2009073）

作者	单位
袁亚宏	西北农林科技大学 食品科学与工程学院，杨凌 712100
蔡露阳	西北农林科技大学 食品科学与工程学院，杨凌 712100
岳田利	西北农林科技大学 食品科学与工程学院，杨凌 712100
高振鹏	西北农林科技大学 食品科学与工程学院，杨凌 712100
赵旭博	西北农林科技大学 食品科学与工程学院，杨凌 712100

中文摘要:

为分离苹果渣中的多酚物质，研究壳聚糖磁性材料对多酚物质提取的影响。采用化学共沉淀法制得Fe3O4磁核，反相悬浮交联法制得磁性壳聚糖微球，并进行胺基化改性；利用扫描电镜、激光粒度仪对微球进行表征。采用单因素试验和响应曲面法对磁性微球吸附分离苹果渣多酚的吸附条件进行了工艺优化。结果表明：胺基化磁性壳聚糖微球吸附苹果渣多酚工艺参数对多酚吸附率有显著影响，因素影响主次顺序为微球用量＞摇床转速＞吸附温度；胺基化磁性壳聚糖微球吸附苹果渣多酚的工艺参数为：微球用量0.25 g/mL，吸附温度45℃，摇床转速127 r/min，吸附率可达81.58%。壳聚糖与Fe3O4磁性物质相结合，对多酚物质具有良好的吸附性能，可以对多酚物质进行快速分离，解析后多酚得率可达78.73 %。研究结果为磁性材料吸附分离多酚类物质提供了理论参考。

英文摘要:

The aim of this study was to provide a new and feasible way for separation apple polyphenols(AP), and to study the influence of AP by chitosan magnetic materials. Fe3O4 particles were synthesized by coprecipitation. Magnetic chitosan microspheres were prepared by inverse suspension cross-linking, and analized through SEM and laser particle size analyzer after aminated. Then, apple polyphenols were adsorbed using the aminated magnetic chitosan microspheres. The single-factor experiment and response surface method were applied to optimize the adsorption factors of AP. Process parameters of AP separation by aminated magnetic chitosan microspheres had significant effect on adsorption rate of AP. The influence order of factors was: usage of microspheres>shaker speed>adsorption temperature. The optimum adsorption conditions of AP by aminated magnetic chitosan microspheres were as follows: usage of microspheres 0.25 g/mL, adsorption temperature 45℃, shaker speed 127 r/min, and under this condition, the adsorption rate could reached to 81.58%. The combination of chitosan and Fe3O4 magnetic material had a good adsorption performance and quick separation of AP. The results of the research can provide a theoretical reference for the adsorption of AP by magnetic materials.

查看全文 下载PDF阅读器

关闭