色谱 2006 24 (4): 407-410 ISSN: 1000-8713 CN: 42-1226/O

研究论文

凝胶渗透色谱法研究壳聚糖生物材料酶降解过程的均匀性

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收稿日期 2005-8-4 修回日期 2005-11-16 网络版发布日期 2006-8-2 接受日期

摘要 壳聚糖是一种重要的生物医用材料，脱乙酰度是影响其生物降解性能的重要因素。运用凝胶渗透色谱研究了脱乙酰度及相对分子质量分布 相似、而聚合单元N-乙酰氨基-D-葡萄糖和D-氨基葡萄糖分布不同的两种壳聚糖材料在溶菌酶作用下的降解过程，分析检测了壳聚糖材料在降解 过程中的重均相对分子质量、相对分子质量多分散性和相对分子质量分布的变化。发现聚合单元为随机分布的壳聚糖样品，其降解是均匀的； 而聚合单元为段状分布的壳聚糖样品，其降解是非均匀的；表明其聚合单元的分布方式决定壳聚糖材料酶降解过程的均匀性。

关键词 凝胶渗透色谱法；壳聚糖；降解；溶菌酶；均匀性

分类号

Study on Homogeneity of Enzymatic Degradation of Chitosan as Biomaterials by Gel Permeation Chromatography

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Abstract

Chitosan is an important biomedical material, and its degree of deacetylation is a main parameter of its biodegradation. Gel permeation chromatography was used to investigate the lysozymic degradation of two types of chitosan samples (A and B) with similar degree of deacetylation and relative molecular mass but with different distributions of two units of N-acetyl-D-glucosamine and D-glucosamine. Weight average relative molecular mass, polydispersity and gel permeation chromatograms during the degradation process were obtained. It was found that chitosan sample A with random distribution of the two units underwent a homogeneous degradation process while chitosan sample B with block distribution underwent a heterogeneous degradation process. The results suggest that the homogeneity of the degradation of chitosan materials by lysozyme depends on the distribution type of the two units, which can help to design chitosan-based biomedical devices.

Key words

gel permeation chromatography chitosan degradation lysozyme homogeneity

DOI:

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