

论文

聚己内酯/聚缩水甘油醚两亲性超枝状大分子的合成及表征

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摘要:

通过简单的两步反应, 合成出新型超枝状聚己内酯/聚缩水甘油醚嵌段共聚物. 以月桂醇为引发剂, 通过开环聚合反应合成羟基封端的聚己内酯; 将聚己内酯进一步和萘钾反应, 得到基于己内酯的大分子引发剂; 引发缩水甘油醚的聚合, 最终形成聚己内酯/聚缩水甘油醚嵌段共聚物. 通过核磁共振氢谱、红外光谱和葡聚糖凝胶色谱对聚合物进行定性表征. 结果表明, 所得到的聚合物既具有聚己内酯的特征峰, 又有聚缩水甘油醚的特征峰, 通过核磁共振氢谱计算出二者在嵌段共聚物中的比例. 在这些聚合物骨架上存在大量的羟基末端基团, 葡聚糖凝胶色谱表征得到单峰, 进一步证明聚合物为嵌段共聚物. 相对于单纯的聚己内酯, 这种聚合物结构的突出优势在于其具有大量可修饰的高活性端基基团, 通过对端基基团的后修饰, 可实现各类配体及多种药物的偶联, 使这种新型材料有可能应用于多功能靶向药物传递.

关键词: PCL-b-HPG 超枝状大分子 聚己内酯 聚缩水甘油醚

Synthesis and Characterization of Amphiphilic Poly(epsilon-caprolactone)-b-hyperbranched Polyglycidol

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Abstract:

A novel diblock copolymer of poly(epsilon-caprolactone)-b-hyperbranched polyglycidol(PCL-b-HPG) was synthesized via a two-step reaction. Firstly, a hydroxyl-terminated PCL was prepared via the ring-opening polymerization using 1-dodecanol as the initiator. The obtained PCL was further treated with naphthalene potassium to get a PCL-based macro-initiator. Secondly, initiated by this macro-initiator glycidol segments were successfully linked to the PCL and the amphiphilic copolymer of PCL-b-HPG was obtained. The structure of PCL-b-HPG was characterized via ¹H NMR, GPC and IR spectra. The component ratio of the two blocks was calculated via the ¹H NMR spectra. IR results show that there are numerous hydroxyl end groups in these copolymers. Single peak was observed by GPC, which further confirmed that these polymers were true copolymers, not just blends. After the copolymerization of glycidol the viscosity decreased, which should increase generally as the molecular weight was increasing. This might be caused by the hyperbranched structure of polyglycidol block. These new materials may provide a promising opportunity to realize.

Keywords: PCL-b-HPG Hyperbranched macromolecule Poly(epsilon-caprolactone) Polyglycidol ether

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1. Sunder A., Hanselmann R., Frey H., *et al.*. *Macromolecules*[J], 1999, 32: 4240—4246
2. Kainthan R. K., Janzen J., Levin E., *et al.*. *Biomacromolecules*[J], 2006, 7: 703—709
3. Oosterom G. E., Reek J. N. H., Kamer P. C. J., *et al.*. *Angew.Chem. Int. Ed.*[J], 2001, 40: 1828—1849
4. Frechet J. M. J.. *Macromol. Symp.*[J], 2003, 201: 11—22
5. Frey H., Haag R.. *Reviews in Molecular Biotechnology*[J], 2002, 90: 257—267
6. Pitt C.G.. *Biodegradable Polymers as Drug Deliver Systems*[M], New York: Marcel Dekker, Inc., 1991: 71—82
7. Halabalova V., Simek L., Dostal J., *et al.*. *Int. J. Polym. Anal. Charact.*[J], 2004, 9: 65—75
8. XU Ning(许宁), WANG Rui(王睿), DU Fu-Sheng(杜福胜), *et al.*. *Chem. J. Chinese Universities(高等学校化学学报)*[J], 2007, 28(9): 1791—1795

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