

研究论文

端基为巯基的聚己内酯的合成

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摘要 以三氟甲烷磺酸亚锡为催化剂, 2-巯基乙醇为引发剂, 在温和条件下引发 ϵ -己内酯的开环聚合, 得到端基为巯基的聚己内酯, 其分子量可控且分布较窄. 在此过程中, 巯基不需要保护而不会影响聚酯的结构, 当聚合温度升高时, 聚合物端基结构不发生改变, 但分子量分布变宽. 端基为巯基的聚己内酯能够通过偶合反应生成中间含二硫键的聚己内酯; 同时, 以2-羟乙基二硫化物为引发剂合成得到分子中间含二硫键的窄分布聚己内酯, 经还原后也可得到端基为巯基的聚己内酯. 这两种方法条件温和, 效率较高, 具有良好的可控性.

关键词 [巯基](#) [聚 \$\epsilon\$ -己内酯](#) [开环聚合](#) [生物可降解性](#)

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Synthesis of Thiol-Terminated Poly(ϵ -caprolactone)

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Abstract Thiol-terminated poly(ϵ -caprolactone) (PCL) was synthesized with 2-mercapto ethanol and through two mild, simple and efficient methods: one is the ring-opening polymerization of ϵ -caprolactone with 2-mercaptoethanol as initiator and stannous (II) trifluoromethane sulfonate as catalyst; the other is the ring-opening polymerization of ϵ -caprolactone with 2-hydroxyethyl disulfide as initiator, followed by reduction reaction. In the first method, when the polymerization temperature was increased, the molecular weight distribution of the final product was broad, while the structure remained unchanged; this thio-end capped PCL can be coupled to form a new polymer with a disulfide group in the center. The structures of these polyesters were confirmed by ^1H NMR spectra and gel permeation chromatography. The polymers show controlled molecular weights and narrow molecular weight distributions. These methods may also be used to prepare other polyesters with thiol-end groups.

Key words [Thiol](#); [Poly\(\$\epsilon\$ -caprolactone\)](#); [Ring-opening polymerization](#); [Biodegradability](#)

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