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#### 论文

聚左旋乳酸-聚乙二醇二嵌段共聚物的非等温结晶行为研究

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### 摘要:

通过变温广角X射线衍射(WAXD)、 差示扫描量热法(DSC)和偏光显微镜(POM)研究了聚左旋乳酸-聚乙二醇 (PLLA-PEG)二嵌段共聚物的非等温结晶行为,并用Ozawa方程分析了PLLA-PEG的非等温结晶动力学. 实验结果表明,高熔点的硬段PLLA结晶符合Ozawa理论,而低熔点的软段PEG对PLLA的结晶起到了稀释剂的作用;当软段PEG开始结晶时,已经结晶完全的硬段PLLA限制了PEG的结晶,使得软段PEG的结晶不符合Ozawa理论. 此外,不同降温速率下的结晶形貌研究结果表明,随着降温速率的增加,晶体经历了从环带球晶、 环带和十字消光的混合球晶到典型的十字消光球晶的转变,并且球晶的尺寸也明显变小.

关键词: 聚左旋乳酸-聚乙二醇(PLLA\|PEG) 非等温结晶 Ozawa方程 晶体形貌

Nonisothermal Crystallization Behavior of Poly(L-lactide)-Poly(ethylene glycol) Diblock Copolymer

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# Abstract:

The nonisothermal crystallization behavior of poly(L-lactide)-poly(ethylene glycol)(PLLA-PEG) diblock copolymer was studied by means of real-time WAXD, DSC and POM, and Ozawa equation was used to analyze the kinetics of PLLA\|PEG under nonisothermal crystallization conditions. During the crystallization of the high-Tm block (PLLA), the low-Tm block(PEG) acts as a noncrystalline diluent, and the crystallization behavior of PLLA obeys the Ozawa theory. When the PEG block begins to crystallize, the PLLA phase is always partially solidified and the presence of the spherulitic microstructure of PLLA profoundly restricts its crystallization behavior, which results in that the overall crystallization process does not obey the Ozawa equation. Furthermore, the study of the crystalline morphology of PLLA-PEG at different cooling rates indicates that when the cooling rate is from low to high, the crystalline morphology undergoes a transformation from the ring-banded spherulites to the typical Maltese cross spherulites, which experiences the mixed crystalline morphologies of ring\|banded and typical Maltese cross spherulitics, and the spherulitic size becomes smaller.

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## 参考文献:

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