

论文

PET/PEN/DBS共混物非等温结晶动力学研究

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摘要:

采用DSC方法, 用修正的Avrami, Ozawa, Ziabicki宏观动力学模型描述PET/PEN/DBS[PET: 聚对苯二甲酸乙二醇酯; PEN: 聚2,6-萘二甲酸乙二醇酯; DBS: 1,3:2,4-二(亚苄基)-D山梨醇]共混物的非等温熔融结晶过程, 研究结果表明, 修正的Avrami模型能很好地描述此共混物非等温结晶过程. 冷却速率在5-20 °C/min范围内, Ozawa方程能很好地描述初期结晶过程, 但结晶后期由于忽略次级结晶而不适宜. 由Ziabicki结晶动力学参数可知, 该共混物的结晶随着成核剂DBS含量的增加而降低, 结晶速率随着成核剂DBS含量的增加而提高. 在非等温结晶条件下, 共混物结晶同时受到冷却速率和共混物组成的影响, 与共混物非等温结晶过程的有效能垒分析结果基本一致.

关键词: PET PEN 非等温结晶动力学

Studies on Non-isothermal Melt Crystallization Kinetics in PET/PEN/DBS Blends

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Abstract:

Macrokinetic models, namely the modified Avrami, Ozawa and Zibicki models, were applied to study the non-isothermal melt crystallization process of PET/PEN/DBS blends by DSC measurement. The modified Avrami model was found to describe the experimental data fairly well. With the cooling rates in the range from 5 to 20 K/min, Ozawa model could be well used to describe the early stages of crystallization. However, Ozawa model did not fit the polymer blends during the late stages of crystallization, because it ignored the influence of secondary crystallization. The crystallization ability of the blends decreases with increasing the DBS content from analysis by using Ziabicki kinetic model, which is similar to the results based on calculation of the effective energy barrier of the blends.

Keywords: PET PEN Non-isothermal crystallization kinetics

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