

模具內的剪切操作對於 iPP/PC 聚摻物 射出成形品的材料結構的影響之研究

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摘要

本研究乃針對在射出成形的過程中，溫度履歷與剪切操作對於 iPP/PC 聚摻物高階結構的影響進行研究。設計一可主動控制剪應變速率之射出成形模具，在實際射出成形過程的保壓階段，對熔融 iPP/PC 聚摻物直接施予剪切操作。

研究結果顯示：PC 的重量比例低於 20% 之 iPP/PC 聚摻物，可改進純 iPP 之物性；施予剪切操作後，可有效改善聚摻物內的相分佈形態，有助材料性能之提昇；且剪切操作可使聚摻物內 iPP 相之球晶形態，由原為多數的混合型球晶轉變形成較小而細緻之 α 球晶，對其抗拉強度之物性有增強之效果。

關鍵字：剪切操作；iPP/PC 聚摻物；相分佈形態；球晶形態；抗拉強度

Effects of Shearing in Injection Molding on the Structure of iPP/PC Blends

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Abstract

This study is investigated the phase morphologies which are affected by the thermal history and shearing during the injection molding processing. The mold is designed for actively controlled shear rate in the processing of the holding pressure and iPP/PC blends are conducted directly by the shearing operation in the cavity.

The results show that the mechanical properties of pure iPP are enhanced in iPP/PC blends by shearing operation while the weight fractions of PC are below 20%. Therefore, the distribution of phase morphologies is improved effectively and the performance of the blends is enhanced after shearing operation. The type of spherulite is transformed the majority of mixed type into many tiny α -spherulites and the tensile strength of the specimens are also be enhanced after shearing.

Keywords: shearing operation; iPP/PC blends; phase morphology; spherulite; tensile strength.