

论文

界面作用对HDPE/POEg/CaCO₃三元复合材料韧性的影响

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收稿日期 2004-8-16 修回日期 2004-9-20 网络版发布日期 接受日期

摘要 通过界面改性, 制备了以CaCO₃为核, 马来酸酐接枝乙烯-辛烯共聚物弹性体(POEg)为壳的高密度聚乙烯(HDPEg)/弹性体(POE)/CaCO₃的三元复合材料. 由于“核-壳”结构的形成, 弹性体和CaCO₃表现出协同的增韧作用. 同未经表面处理的CaCO₃复合材料相比, 在相同的CaCO₃含量的情况下, 表面处理的CaCO₃由于与弹性体形成更强的界面粘结, 使得三元复合材料的“脆-韧”转变发生在较低的弹性体含量.

关键词 [协同增韧作用](#) [核-壳结构](#) [界面粘结](#) [聚烯烃](#)

分类号

EFFECT OF INTERFACIAL INTERACTION ON THE TOUGHNESS OF HDPE/POEg/CaCO₃ TERNARY COMPOSITES

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Abstract High-density polyethylene / elastomer / calcium carbonate ternary composites with dispersed phase of calcium carbonate as a core and maleated elastomer(ethylene—octane copolymer)POEg as a shell were prepared through the reactive extrusion. The improvement of impact strength of HDPE / POEg was limited due to the high miscibility between them. The introduction of CaCO₃ had a negative impact on the toughness of the HDPE matrix because of the poor interfacial adhesion. However, in these ternary composites, the calcium carbonate and elastomer showed synergistical toughening effects on the HDPE matrix as a result of the formation of core—shell structures due to the strong interaction between POEg and CaCO₃, which improved the HDPE—CaCO₃ interfacial strength and the toughness of the blends. The brittle-ductile transition occurred at lower contents of POEg for surface treated calcium carbonate based ternary composites compared with the untreated calcium carbonate based ones.

Key words [Synergistically toughening effects](#) [Core-shell structure](#) [Interfacial adhesion](#) [Polyolefin](#)

DOI:

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