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The Construction of Sandbag Microstructure in Polyamide 6/Ethylene–Propylene–Diene Terpolymer/Nanometer Calcium Carbonate Ternary Composite

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Abstract

A sandbag microstructure was constructed in polyamide 6 (PA6)/ethylene– propylene–diene terpolymer (EPDM)/nanometer calcium carbonate (nano-$CaCO_3$) ternary composites by the addition of maleinated EPDM (EPDM-g-MA) to reduce the interfacial tension between EPDM and PA6 and EPDM and nano-$CaCO_3$. Scanning electron microscopy observation and differential scanning calorimetry analysis revealed that the microstructure of the ternary composites evolved from the initially separated EPDM and nano-$CaCO_3$ dispersion structure to the sandbag structure and finally to the separated dispersion structure again with the increase of EPDM-g-MA content in the elastomer

phase. The mechanical results showed the composites with the sandbag microstructure exhibited excellent toughness and stiffness.

Keywords:

EPDM-g-MA | interface tension | PA6 | nanoparticle | sandbag microstructure | ternary composite

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