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

Xu Wang, Xiaodong Wang & Xiangbin Xu

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Abstract

A sandbag microstructure was constructed in polyamide 6 (PA6)/ethylene-propylene-diene terpolymer (EPDM)/nanometer calcium carbonate (nano-CaCO₃) ternary composites by the addition of maleinated EPDM (EPDM-g-MA) to reduce the interfacial tension between EPDM and PA6 and EPDM and nano-CaCO₃. 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-CaCO₃ 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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