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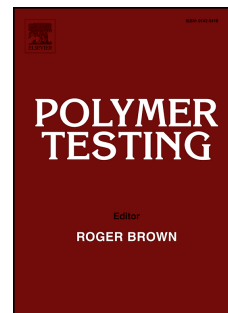
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Material Properties

Impact Fracture Toughness and Flow Properties of Polypropylene Composites

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ABSTRACT

The impact fracture strength, melt volume flow rate (MVR) and melt density of polypropylene composites filled separately with two flame retardants (aluminum hydroxide and magnesium hydroxide), zinc borate (ZB), polyolefin elastomer (POE) and nanometer calcium carbonate (nano-CaCO₃) were measured to identify the effects of the flame-retardant content on the flow properties and impact fracture toughness. The results showed that the MVR decreased with increasing flame-retardant weight fraction (ϕ_f) while it increased with increasing load; the melt density increased approximately linearly with increasing ϕ_f while the influence of the ZB, nano-CaCO₃, POE and load on the melt density was insignificant. The V-notched Izod impact strength increased when ϕ_f was lower than 30 wt.%, then it decreased slightly with increasing ϕ_f . The value of the V-notched Izod impact strength reached a maximum at ϕ_f about 20 wt.%.

Key words: polymer-matrix composites; impact strength; rheology; extrusion; morphology.

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