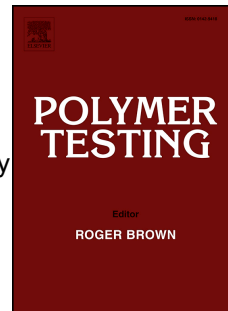


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Influence of interparticle interaction effects on the rheological properties of low density polyethylene filled with glass beads

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Abstract:

The rheological properties of Low-density polyethylene (LDPE) compounds with different fractions of glass beads have been investigated by means of high pressure capillary rheometry. The purpose of this study is to find a functional approach for describing the flow behaviour of suspensions under consideration of interparticle interaction effects as a function of the volumetric filler content and the applied shear stress or shear rate, respectively. The flow behaviour of suspensions is influenced by interaction effects, which are dependent on the filler particle, its volume content and particle size. While small glass beads exhibit pronounced interparticle interaction effects even at low volumetric filler concentrations, large glass beads show a plateau of negligibly interactions up to approx. 20 % volumetric filler content. With introducing a generalized interaction function the flow behaviour of the tested suspensions could be described with reasonable accuracy in consideration of the transition from negligible to pronounced interactions.

Keywords:

High Pressure Capillary Rheometry, Rheology, Interaction Effects, Generalized Interaction Function, Glass Beads, Suspension

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