

Static and dynamic compressive properties of mica/polypropylene composites

Abstract

The static and dynamic properties of mica/polypropylene composites, with a mica content of 10, 15, 20% by weight, were studied at different levels of strain rates (from $10s^{-4}$ to $10s^2$), using a conventional Universal Testing Machine and Split Hopkinson Pressure Bar apparatus. The results show, that the mechanical properties of mica/polypropylene composites, in terms of yield stress, fracture strain, compression modulus and compressive strength, were greatly affected by the level of strain rates applied and mica content. It was found that the Bergström model was both consistent and reliable, in evaluating the effect of the strain hardening mechanism of the composites, in respect to the applied strain rate. The relationship between the strain rate sensitivity and the thermal activation volume of the mica/polypropylene composites were successfully obtained at various mica contents, where the results show a contradicting pattern for both parameters.