

Modelling polymer/clay nanocomposites using statistical and continuum approaches with experimental verification

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In the polypropylene/clay nanocomposite system a third material component, the compatibiliser, is used to enhance the strength of the bond between particle and matrix. Its effects amount to an improvement of the material properties of the matrix/filler interface. Experimental studies in this laboratory have explored the effects of both the clay, the compatibiliser content and processing conditions in terms of the effect on the small-strain modulus of the composite. In parallel with this work we have developed finite element models of the composite. The modelling gives insights into the physical mechanisms that govern the action of the interface, and leads to useful models of the system to aid processing.