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Abstract

The thermal stability and flame retardancy properties of polypropylene (PP) nanocomposites containing graphene nanoplatelets (GNPs), glass fibres (GFs) or a hybrid mixture of the two fillers were investigated. The GNPs enhanced the thermal stability of the nanocomposites by at least 48 ^{o}C as a result of the nanoconfinement of the polypropylene chains and the prevention of the emission of the gaseous molecules during decomposition. Pyrolysis combined with gas chromatography and mass spectroscopy showed that the decomposition mechanism of the polymer was not altered by the presence of the nanofillers and the alkenes that comprised of 3*n* carbon atoms were the main degradation products. Cone calorimetry tests revealed a significant delay of