

POLYOLEFIN-CLAY NANOCOMPOSITES: PROCESSING, AGEING, DEGRADATION AND ANALYTICAL METHODOLOGIES

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Abstract

The effects of the environment on the performance of polymer products are well documented but very little is available in the open literature on the performance characteristics of products based on polymer nanocomposites (PNCs). It is generally accepted that the presence of layered silicate nanofillers in PNCs offer significant advantages in terms of barrier properties, fire retardancy, mechanical properties [1]. However, in polyolefin-based nanocomposites these nanofillers ate themselves the source of inherent instability when compared to their unfilled polymer counterparts in both stabilised and unstabilised formulations.

The effects of accelerated weathering on the stability of polypropylene nanocomposites (PPNCs) and their unfilled analogues were investigated. Performance indicators used for monitoring degradation, both in the bulk and at the surface, with ageing of stabilised an unstabilised samples include dynamic mechanical properties and spectroscopic markers. The effects of ageing on the states of dispersion of the nanofiller in PPNCs are demonstrated through spectroscopic and microscopic tools.

References

- [1] L.A. Utracki, in *'Clay-Containing Polymeric Nanocomposites'*, Vol. 1 and 2, RAPRA Technology, Shawbzry, UK (2004)