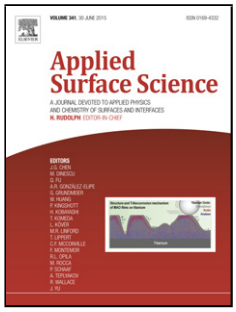

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Polyethylene Oxide – Fullerene Nanocomposites

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Highlights

- A new behavior of Raman spectra in polymer-fullerene nanocomposites is demonstrated.
- Effect of the nanofiller on the polymer/filler crystals are discussed
- Modifications on Raman lines due to the loading with C60 are reported.

ABSTRACT

Polyethylene oxide – fullerene nancomposites have been prepared by using the solution path with water as solvent (only for the polymer). The dispersion of C60 within the polymer solution was achieved by high power sonication. The study aims to a better understanding on the effect of C60 nanoparticles on the macromolecular chains. Raman and Wide Angle X Ray spectroscopy were used to inspect the interactions between nanofiller and macromolecular chains. The experimental results revealed a completely different behavior of fullerene dispersed within polymeric matrices than carbon nanotubes and nanofiller. The observed difference was assigned to the huge aspect ratio of carbon nanotubes and nanofibers (compared to the fullerene) and to the high thermal conductivity.

Keywords: fullerene; Raman; X-Ray; polyethylene oxide; nanocomposites