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Structural, Morphological Properties of Polypropylene/Strontium Carbonate ($Srco_3$) Nanocomposites

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ABSTRACT

The present study aimed to investigate the effect of incorporated nanoparticles of Strontium carbonate ($SrCO_3$) on structural and morphological properties of thermoplastic polymer matrix polypropylene (PP). Strontium carbonate nanoparticles were synthesized and reinforced in polypropylene matrix in order to prepare PP/$SrCO_3$ nanocomposites with filler loadings of 1%, 3%, 5% and 10% weight of PP by melt-mixing method. The formed $SrCO_3$ nanoparticles size ranging from 6–9.8 nm was calculated by XRD analysis. The XRD findings are in good agreement with SEM results. Confirmation of nanocomposite formation was obtained by FTIR studies. The studies have revealed that a considerable change in the morphology was observed at $SrCO_3$ filler loading of 5% weight of PP when compared to other filler loadings for enhanced properties and applications.

Highlights

- First report on the synthesis of nanocomposites based on polyolefin's incorporated with $SrCO_3$ nanoparticles.
- Structural and morphological studies were carried out with XRD, SEM and FTIR.
- SEM studies were in agreement with XRD reports.
- PP/5% $SrCO_3$ was found to be the better composite, which has the potential to exhibit good enhanced properties.

Keywords: Strontium Carbonate Nanoparticles, Polypropylene, morphology, nanocomposites.