

## Influence of nanosized $\text{CaCO}_3$ content in tailoring the structure, the morphology and the thermal and mechanical properties of iPP/PA66/PP-g-MA alloy

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### ABSTRACT

Nanocomposites of Polypropylene/Polyamide 66 (iPP/PA66) with a weight ratio of (70/30) filled with stearic acid-treated nanosized  $\text{CaCO}_3$  were melt compounded in the presence of a fixed amount of grafted polypropylene maleic anhydride (PP-g-MA) in a Brabender mixer. The purpose of this research is to obtain nanocomposites with high-performance structural, morphological, and thermomechanical properties. The obtained properties are discussed in light of the content of nano- $\text{CaCO}_3$  and of the induced interfacial bonding properties generated by the insertion of the compatibilizer. The results confirmed that, according to the FTIR spectroscopy analysis, the existence, on one hand of possible interactions between PP-g-MA and PA66 and, on the other hand, between stearic acid and PA66. XRD results show that nanosized  $\text{CaCO}_3$  particles play the role of nucleating agents in the matrix and thus increasing the crystallinity of the blend. SEM results revealed that the treated nanosized  $\text{CaCO}_3$  was more homogeneously dispersed in the (iPP/PA66), and a refinement of the morphology and better dispersion of the filler were detected after the addition of PP-g-MA. From the mechanical point of view, the incorporation of  $\text{CaCO}_3$  increased appreciably the tensile strength at break and the tensile modulus of (iPP/PA66) blend.

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