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Quantitative analysis of phosphorus containing nucleating agent in polymer resin by ICPMS

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Neat polymer materials have poor stability and would result in a commercial failure if they are used virgin. A nucleating agent is used in polypropylene, providing superior mechanical properties, easier dispersion and reduced interaction with metal stearate and to give a high degree of crystalline resulting in increased mechanical properties such as hardness, elasticity modulus etc, and improve optical properties such as transparency in different grade of copolymer polypropylene virgin powder. Nucleating agent and some secondary antioxidants are also used which are phosphorus based. Due to common phosphorus metal in both additives, it is difficult to analyze the contribution of individual quantity as per standard test method ASTM D 6247 "Analysis of elemental content in additive in polyolefin by X-Ray fluorescence spectrometry [4]. All components in the combination of various additives were also not significantly separated in gas chromatography and High-performance liquid chromatography. A new method developed to the analysis of nucleating agent in a range of 0.01% to 0.1% concentration. Repeatability and validation of the method established.

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