

## **Evaluation and quantification of grafting degree of maleic anhydride in polypropylene through rapid techniques.**

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Polypropylene (PP) grafted with maleic anhydride (MAH) has been known to act as compatibilizer with polar polymers and coupling agent for filled polymer compounds. The degree of grafting is very important to improve the interfacial interaction between the components in polymer blends and polymer composites to maximize the physical properties. The PP-grafted-MAH was traditionally characterized by wet classical titration and Nuclear magnetic resonance spectroscopy (NMR) methods, and correlated with polymer properties. But these methods has high limitations, considering in the wet classical titration the selective quantification of grafted maleic anhydride will interfere with the residual content, though C-13 NMR can be an alternative but it is highly time consuming and less sensitive. We have developed a modified and rapid Fourier transform infrared spectroscopy (FTIR) method for the accurate quantification of MAH in PP. Infrared spectrum band fit minimizes the error in determine the content of maleic acid and it is simple and useful method for evaluating the percentage of grafting using the ratio from band heights of the infrared spectrum at specific wave numbers correspondent to each component in the mixture. The degree of grafting is further substantiated by titration technique and verified with FTIR method.

### **References:**

1. "Synthesis of polypropylene-graft-maleic anhydride compatibilizer and evaluation of nylon 6/polypropylene blend properties" by N Abacha and S Fellahi.