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ITSARA PREECHACHON: EFFECT OF INTERFACIAL AGENT ON THE
MORPHOLOGY AND PROPERTIES OF POLYPROPYLENE COMPOSITES.
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Polypropylene (PP) composites containing ethylene-octene copolymer (EOR) and calcium carbonate (CaCO_3) filler were investigated. Particular consideration was given to the effects of an interfacial agent on the composite morphology and properties. The interfacial agent used in this study was EOR grafted with maleic anhydride (EOR-g-MA). The grafting reaction was carried out in an extruder. The grafted products were characterised by FTIR, MFI and titration techniques. Various PP composites with and without EOR-g-MA were prepared by a melt-mixing process. The composite morphology was evaluated using SEM, DMA and DSC techniques. The mechanical tests included tensile and impact measurements.

Grafting of EOR in the extruder using dicumyl peroxide (DCP) as an initiator was found to be successful. Increasing the DCP content leads to an increase in the content of MA grafted on EOR. A study of composite morphology shows a separate dispersion of elastomer and filler in composites containing unmodified EOR. The use of EOR-g-MA, on the other hand, leads to an encapsulation of filler particles. The extent of encapsulation is dependent on the MA content and molecular mobility of elastomer. Comparison to composites with unmodified EOR, composites containing EOR-g-MA as an interfacial agent shows higher tensile yield stress but lower modulus and elongation. Increasing the concentration of EOR-g-MA in the composites leads to an improvement in impact strength and elongation. The variations of MA content in EOR in the range of 0.5-1.5% hardly change the mechanical properties of the composites. A study of EOR-g-MA viscosity affecting on morphology and mechanical properties of PP composites is suggested for further investigation.