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Polyamide-Impact Modifier-Organoclay Nanocomposites

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In this study, ternary nanocomposites composed of polyamide, organoclay and ethylene/butyl acrylate/maleic anhydride (E-BA-MAH) terpolymer acting as impact modifier for polyamide were studied. The components were melt blended using a corotating twin-screw extruder. X-Ray Diffraction patterns of the nanocomposites showed that the interlayer spacing of the organoclays Cloisite® 25A and Cloisite® 30B increased in nylon 6-montmorillonite binary nanocomposites, as well as in ternary systems. In the presence of elastomer, the Melt Flow Index of the unfilled polyamide 6 and the ternary nanocomposites decreased owing to the high viscosity of elastomeric material and the possible reactions between the elastomer and polyamide 6. The degree of crystallinity and the melting temperature of the nanocomposites did not change appreciably with the presence of elastomer or organoclay. In most cases, the tensile properties of the ternary systems resembled the tensile properties of elastomer - nylon 6 binary blends. It can be concluded that the effect of elastomer is more dominant than the effect of organoclay. Synergistic improvement was obtained in the impact strength of the nylon 6- (E-BA-MAH) - Cloisite® 25A ternary system.