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## The Influence of Filler Concentration on the Final Properties of Surlyn/Clay Nanocomposites

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Nowadays, polyolefin nanocomposites belong to the one of the most investigated groups of polymer nanocomposites in both industrial and academic research. A third component has to be added when the formation of polyolefin-based nanocomposites is realized, such as maleic anhydride grafted polypropylene or polyethylene, which improves the polyolefin-filler interactions. On the other hand Surlyn, copolymer used in this study, belongs to the group of ionomer containing hydrophilic and hydrophobic groups. Chemically Surlyn is based on copolymer of ethylene and methacrylic acid, whose carboxylic groups are neutralized by ions. In other words a few mole per cent ionic groups were included along the polyethylene backbone. So, this copolymer can interact with the modified clay more effectively to form intercalated or delaminated structures and do not require the third component. Surlyn/clay nanocomposites have been prepared by the melt intercalation method using single screw extruder called Buss KO-kneader. First of all four types of nanofiller based on sodium type of montmorillonite different in the used amine group as an intercalating agent were tested. From this group the nanofiller with the highest effect on the final properties, which also provided the best dispersion in polymer matrix, was chosen. Afterwards five values of this nanofiller concentration, namely 0.5, 1, 3, 5 and 7 wt. % were tested to determine the influence on the following properties: dynamical thermo mechanical, tensile, flexural and barrier properties. In addition to these properties, X-ray diffraction, and transmission electron microscopy was used to observe the structure of Surlyn/clay nanocomposites.