



**STUDYING INTERACTIONS OF MODIFIED CLAYS ON POLYPROPYLENE BY USING DIFFERENT MODIFIERS.**

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Polypropylene (PP) is one of the most used raw materials for packaging applications. Due to the good properties of this material it is used in different transformation processes, as extruded film, injected pieces, etc. Polypropylene presents good barrier properties against water, however, it has low barrier against O<sub>2</sub> and CO<sub>2</sub>. For some packaging applications to reduce oxygen and carbon dioxide permeabilities, it is indispensable in order to extend the shelf life of the food products packaged. One possible solution is the preparation of clay based nanocomposites, since exfoliated clays can reduce permeability values. However the main problem to obtain exfoliated structures is the difference in polarity between clays and PP. In order to achieve good interaction and compatibility between clay layers and PP matrix, two different paths have been followed: (i) the use of tailor made clays with specific surface modification and (ii) and the use of different maleic anhydride grafted polypropylenes. Interactions of the different phases have been evaluated, classifying the structure morphology in agglomerated, intercalated, and exfoliated through the use of X-ray diffraction techniques. The relationship between structure morphology and barrier properties has been established. As a result, it has been found a ternary system (PP/anhydride modifier/modified clay) with the optimum barrier properties. The improvement in O<sub>2</sub> and CO<sub>2</sub> permeability will allow the use of PP in applications not covered currently, avoiding the use of complex solutions as multilayer materials.