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NATURAL AGEING OF THE POLYPROPYLENE: MORPHOLOGICAL AND THERMAL PROPERTIES

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Promote adhesion of polyolefins in laminated (multilayer) paints, adhesives and other substrates, various techniques are used for the surface treatment to make the surface hydrophobic in a surface more wettable, but the degradation of polyolefins can be accelerated by modifying of chemical structure from chain by incorporating of a functionalizing agent (molecule that has one of the extremity polar and the other nonpolar). The subject of this work is to comparatively study the influence of climatic parameters (temperatura, UV irradiation, rain between others) on the PP and PP functionalized degradation. In a first step the samples of pure PP and PP functionalized with 4% of grafting maleic anhydride (PP-g-MA) were processed in an extruder screw simple in two temperature profile (180, 190, 200°C and 190, 210, 240 °C). After these samples were processed by thermal compression molding (TCM), in the plates form. In the second step, these molded plates were exposed to natural ageing during 210 days. The presence of maleic anhydride group influenced on PP degradability. This fact was assessed by the thermal and morphology properties of the samples after 10, 120 and 210 days of natural ageing. Thermal analysis was used to study the degree of crystallinity (X_c) and oxidative induction time (OIT) by Differential Scanning Calorimeter (DSC), and modification of the morphological properties by Scanning Electronic Microscopy (SEM). Preliminary results of SEM of morphological surfaces from functionalized PP samples showed greater degradation photochemical oxidative when compared to non-functionalized, due to increase of rugosity and formation of microvoids. These voids have influenced the increased fragility of these samples. There was a decrease in the OIT with the time of exposure to natural weathering