



## Study of PP/Polybutene Blends Modified by Gamma Irradiation and HMS-PP/Polybutene Blends

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The polypropylene (PP) has been applied to a wide range of production due to its various excellent properties such as cheapness, high stiffness, chemical resistance, no environmental pollution when incinerated, low specific density and good mechanical properties. However, PP is a linear polymer which exhibits low melt strength. One of the effective approaches to achieve high melt strength (HMS) is to add chain branches onto backbone polymers. High melt strength polypropylene (HMS-PP) has been recently developed and introduced in the market by the major international polypropylene producers. As a consequence different methods have been applied to modify polypropylenes by chain branches. The technology obtained by IPEN together with EMBRARAD and BRASKEM comprises chain branches added onto backbone species using gamma radiation, which is generated from a  $^{60}\text{Co}$  source. Such radiation is very convenient in order to improve polymer materials by grafting, crosslinking and degradation. Another important approach to the development of polymer materials is based on the combination of different polymers into a new product having some of the desired properties of each component. In this work, gamma irradiation technique was used to induce chemical changes in commercial polypropylene (HMS-PP) that was after blended with polybutene and in polypropylene/polybutene blends. The samples were irradiated with a  $^{60}\text{Co}$  source at doses of 12,5 and 20kGy in the presence of acetylene. It was investigated how the two different routes of blends processing can modify their properties. Indeed the results from melt flow, gel fraction and rheology reveal the influence of the process route in the blends properties. Effects on the elongation at break and break strength were observed by the results of mechanical tests. The results from rheology demonstrated an increase in melt strength and drawability of the blends.