



ELECTRON SPIN RESONANCE STUDIES ON PS, PP AND PS/PP BLENDS UNDER GAMMA IRRADIATION

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Electron Spin Resonance (ESR) studies on Polystyrene (PS), Polypropylene (PP) and their mixtures at compositions of 80/20 with and without a compatibilizer (SBS in block), 7.5wt.%, irradiated with gamma rays from a Cobalt-60 source with a dose rate of 4.8 KGy/h at integral doses of radiation of 10, 25, 50, 60, 70, 400, 800 and 1300 KGy in the presence of air and at room temperature (RT) are reported. The dependence of resonance line width, H_{pp} ; resonance line shapes K , and radical concentration, S , with the integral dose of irradiation is investigated. The nature of the free radicals after ten days of air storage is discussed. The free radical concentration, the double integral of the resonance line, S , has been estimated at room temperature, RT, for a group of single lines, characterized by the same giromagnetic, g , value by direct numerical double integration. In the samples studied no spectrum of 0 kGy of integral dose was observed. The concentration of radicals, S , observed when the integral radiation doses was increased, presents a maximum value in the PP samples at high doses (70-1300 kGy) and minimum values in the PS samples with the same doses. This shows that the PP degrades at a faster rate than the PS, owing to the presence of the benzenic ring in the latter. In the PS/PP mixtures studied with and without compatibilizer, the values of the radical concentration is found between the observed values in the homopolymers, being closer to the PS, which might imply that the presence of PS delays the degradation process of the PP in the mixture.