

# Styrene grafted onto polypropylene and polytetrafluoroethylene films

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Key words: polypropylene, polytetrafluoroethylene, graft polymerization

The objective of this work is to present results of radiation-induced grafting polymerization of styrene onto polypropylene (PP) films with 0.04 mm thickness and polytetrafluoroethylene (PTFE) films with 0.2 mm thickness. Both films were processed in the same method. The films were placed in a glass tube in contact with styrene monomer/toluene (1:1, v/v) solution and nitrogen was bubbled to guarantee inert atmosphere. The films were irradiated at 20, 40, 80 and 100 kGy doses at room temperature in cobalt-60 source. After irradiation process the samples were kept in the solution and at room temperature to 7, 14, 21 and 28 days in order to evaluate the grafting behavior. Another aspect studied was the effect of radiation dose on the grafting yield. The samples were characterized by Thermogravimetry Analysis (TGA), Differential Scanning Calorimetry (DSC) and Infrared Spectroscopy (FTIR). The degree of grafting (DOG) was calculated gravimetrically. The DOG results revealed that after 21 days at 100 kGy is achieved the higher grafting in the films (table 1). By TG is verified that PTFE grafted exhibit two steps of degradation and the PP grafted only one step of degradation.

Table 1-Relation between DOG(%) and dose.

Dose (kGy)	DOG(%)	
	PTFE	PP
20	2,7	0
40	13,8	6,6
80	20,1	15,7
100	20,1	16,5