

NUCLEAR TRACKS IN POLYMER FILMS AND MEMBRANES PREPARATION

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Abstract. The chemical modifications induced by energetic heavy ion irradiation of polycarbonate (PC) film are determined by GPC, HPLC, ESR, TGA, IR and UV spectrophotometries. The main results of the irradiation are radical creation, chain scission, cross-linking and appearance of new chemical groups in the main polymer chain. As far as the creation of new groups is concerned, they are determined by means of a model compound of PC : the diphenyl carbonate (DPC). The following compounds are identified after energetic heavy ion irradiation of DPC : salicylic acid, phenol, 4,4'-biphenol, 2,4' -biphenol, 2,2'-biphenol, 4-phenoxyphenol, 2 - phenoxyphenol, phenyl ether, phenyl benzoate, phenyl salicylate, 2-phenylphenol and 2-phenoxyphenyl benzoate. A similarity between the heavy ion irradiation and a heat treatment has also been established with DPC.

On the basis of these results, we try to give an explanation of the preferential attack along the tracks of the irradiated film. Also, an explanation of the well-known beneficial effect of an UV exposition of the irradiated film on the selectivity of this preferential chemical attack is suggested.