

Characterization of Gamma Irradiated PVDF and PVDF/Graphene Oxide Composites by Spectroscopic Techniques

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Abstract : The combination of the properties of graphene oxide (OG) and PVDF homopolymer makes their combined composite materials as multifunctional systems with great potential. Knowledge of the molecular structure is essential for better use. In this work, the degradation of PVDF polymer exposed to gamma irradiation in oxygen atmosphere in high dose rate has been studied and compared to degradation of PVDF/OG composites. The samples were irradiated with a Co-60 source at constant dose rate, with doses ranging from 100 kGy to 1,000 kGy. In FTIR data shown that the formation of oxidation products was at the both samples with formation of carbonyl and hydroxyl groups amongst the most prevalent products in the pure PVDF samples. In the other hand, the composites samples exhibit less presence of degradation products with predominant formation of carbonyl groups, these results also seen in the UV-Vis analysis. The results show that the samples of composites may have greater resistance to the irradiation process, since they have less degradation products than pure PVDF samples seen by spectroscopic techniques.

Keywords : gamma irradiation, PVDF, PVDF/OG composites, spectroscopic techniques

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