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In the last few years, much attention has been focused on research to prepare new generation of Poly (para – substituted styrene), and to study the irradiation, thermal and plasticization effects on stability of these new polymers. The photodegradation of irradiated solid films was studied by using UV – Visible, Fluorescence, FT - IR and TLC spectroscopic techniques. Irradiated pure and blended Poly (para – substituted styrene) solid films showed a gradual increase in the absorption intensity of the main band with the increase in the number of blended plasticizers and increase in the irradiation time as well as the formation of new bands at longer wavelengths. The fluorescence spectra of irradiated polymers in solid films and in solutions of different polarity, showed a deformation in the fluorescence main band and the appearance of new bands at longer wavelengths, indication the distraction of polymer chains and the formation of new photo products through the formation of free radical reactions. The FT – IR spectra of irradiated pure and blended solid films, showed an increase or decrease of the polymer vibration frequencies, as well as a change in numerous inferred bands intensities. The increase in the intensities of the analyzed ranges is attributed to the formation of carbonyl, hydroxyl, and aliphatic ketones and to the increase in the number of polyene structures that resulted from hydrogen abstraction during photodegradation reactions. The analysis of the Fourier-transform infrared spectra of the irradiated and nonirradiated samples showed a noticeable formation of a new broad band centred at ($1,727\text{ cm}^{-1}$, C=O),

assigned to the growth of aliphatic ketones formerly from the reaction of reactive alkoxy radicals. Its intensity was found to increase with the increase in irradiation time and also with the increase in the amount of added Terephthalate and phthalates plasticizer, indicating an increase in the efficiency of the photo degradation process. The analysis of fragments that resulted from the photo irradiation samples of PSP in solution, using electrospray ionization-ion trap (ESI). Where the separation and determination of the fragments which resulted from degraded polymer were studied by LC– ESI-MS in positive mode and gave the best specificity and sensitivity for their detection. The positive ion (ESI-MS) spectra showed five main peaks of the total ion chromatogram (TIC). All the compounds that were resulted from the photodegradation of the irradiate polymer solution gave the protonated molecules [$M^+ H^+$] after ionization in the electro spray source. The fragmentation ions showed the formation of monomer, dimer and oxygenated organic compounds.

Speaker Biography

Khalid E Al Ani has completed his PhD from Southampton University, England and Postdoctoral studies from Texas University, USA. He was a Visiting Professor at Liverpool University at the Inorganic and Industrial Department, Liverpool, UK. He was a Professor at Baghdad University, Department of Physical Chemistry, Iraq. He was also a Professor of Physical Chemistry at Oran University of Science and Technology- Algeria, Hashemite University, Jordan. He was the Dean of Faculty of Pharmacy and currently the Head of the Pharmaceutical Sciences Department at Jadara University, Irbid, Jordan. He has published more than 48 original articles in international journals and attended many international conferences.

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