GAMMA IRRADIATION AND WEATHER EFFECTS ON THE DIELECTRIC DISPERSION OF LOW DENSITY POLYETHYLENE

H. A. Motaweh, M. Y. H. Keshk, and Abdel Hamed-Sakr
Physics and Chemistry Department, Faculty of Education, Alexandria University, Egypt

M. E. Kassem and E. Bassiouni
Physics Department, Faculty of Science, Alexandria University, Egypt

The a.c. electric properties of low-density polyethylene grad (LA071) have been studied in the frequency range (500 Hz - 5 MHz) and exposure gamma irradiation doses (0–50 Gy). The sample was also exposed to the weather outdoor. It was found that a.c conductivity $\sigma(w)$ of sample depends both on frequency and exposure time together with the gamma irradiation doses. The results obtained due to the effect of these factors on the dielectric dispersion of LA0710 have been analyzed to determine how the relaxation time changes with outdoor exposure time and gamma irradiation doses, and show that AC measurements can be used to obtain the type of conductivity. The shapes of complex plane plots of dielectric constant are semicircles. The results can be discussed in terms of oxidation and crosskicking.