

(Research Article ٤)

**Gamma-induced changes in some of the structural and optical properties of
Makrofol polycarbonate/silver nanocomposites films**

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Published in: *Radiation Effects and Defects in Solids*, 2017, 172(1-2): 48-60.

Impact factor : 0.526

ISSN: 1042-0150

Nano-sized silver (Ag) was prepared and mixed with Makrofol polycarbonate (PC) (5 wt%) to produce nanocomposites films. Samples from the PC/Ag nanocomposite films have been exposed to gamma radiation in the dose range of 20–300 kGy. The consequential effect of gamma radiation has been studied using X-ray diffraction, fourier transform infrared spectroscopy and UV spectroscopies and color difference measurements. The results indicate that the gamma irradiation up to ~150 kGy increases the intermolecular interaction of PC chains and Ag that could be attributed to crosslinking that destroys the ordering structure, giving the polymer more resilience. This was accompanied with a reduction of the optical energy gap and an increase in refractive index. In addition, the color intensity, which is the color difference between the irradiated samples and the non-irradiated one, increases with increasing the gamma dose at the range of 20–150 kGy, accompanied with an increase in the blue and green color components.