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## X-ray irradiation-induced changes in (PVA-PEG-Ag) polymer nano-composites films

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The effects of X-ray irradiation on the structural, thermal and optical properties of polyvinyl alcohol-polyethylene glycol-silver (PVA-PEG-Ag) nano-composites have been investigated. The samples of nano-composites were prepared by adding Ag nanoparticles with 5 wt% to the (PVA-PEG) blend. The films of 0.05 mm thickness were prepared by the casting method. These films were irradiated with X-ray doses ranging from 20 to 200 kGy. The resultant effect of X-ray irradiation on the structural properties of PVA-PEG-Ag has been investigated using X-ray diffraction and Fourier transform infrared spectroscopy. Also, thermal property studies were carried out using thermogravimetric analysis. Further, the transmission of the PVA-PEG-Ag samples and any color changes were studied. Fourier transform infrared spectroscopy measurements showed that the crosslinking is the dominant mechanism at the dose range 50-200 kGy. This led to a more compact structure of PVA-PEG-Ag samples which resulted in an improvement in its thermal stability with an increase in the activation energy of thermal decomposition. Moreover, the color intensity  $\Delta E$  was greatly increased with an increase in the dose and was accompanied by a significant increase in the yellow color component.

### Biography

M M Abutalib is an Associate Professor of Nuclear Physics and his research area includes Nanomaterials and Materials Science.

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