

## **Gamma Radiation Synthesis and Characterization of Polyvinyl Alcohol/ Silver Nanocomposites Film**

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### **Abstract**

For the wider interested applications of polymer hybridized metal nanoparticles composites, poly(vinyl-alcohol)/Silver nanoparticles composites in a form of film has been prepared by in situ  $\gamma$ -irradiation doping technique up to 50 kGy. The effect of radiation upon the composites resulted in reducing the silver ions into black metallic silver, so the general film color changed from white to golden-yellow then black color at 50 kGy. The UV-visible spectroscopy revealed an absorbance band peaking at 425 nm which has been increased exponentially with dose increment. Also the study of UV-spectrogram revealed that the maximum absorbance  $A_{\max}$  is being increased following the particles radius. Also the Scanning electron Microscopy (SEM) revealed shiny nanoparticles of Silver cored in Polyvinyl-alcohol PVA with homogeneous distribution and having an average size of 30 nm as well as the XRD spectrum that shows cubic center face of silver nanoparticles in the film. Also it showed that a crystalline peak for PVA reduced by radiation to amorphous phase.

**Keywords:** *Irradiation of Polymer Nanocomposites*