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Promising Cu-doped Polyvinyl Alcohol Films for Optical and Photoconductive Applications

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Abstract

Pure and Cu-doped Poly Vinyl Alcohol (PVA) film samples with different concentrations of copper (5,10,15 and 20 % weight percent) were prepared by the conventional casting technique. The structural, optical and photoconductive properties of pure and doped films were studied. X-ray diffraction pattern of the investigated samples reveals the interaction between the filler and polymer which leads to decrease the crystallinity with riching amorphous phase. Optical spectrophotometric measurements showed blocking of UV range in transmission spectra of 20% wt Cu-content where the determined indirect Optical energy gap strongly decrease from 4.96 eV for pure PVA to about 2.85 eV for this sample. Film samples exhibit positive photoconduction effect where the light reduce the resistance or increases its conduction in addition to that photosensitivity strongly increase by increasing both light intensity and copper concentration in the polymer matrix.

Keywords: Polymer films, Casting technique, Optical Absorption, Energy gap, Photoconductivity.

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