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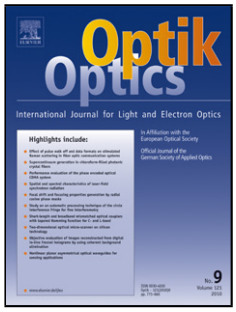

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Investigation of optical bandgap variation and photoluminescence behavior in nanocrystalline CuO thin films

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Abstract: Since the absorption spectrum of CuO is well matched with the spectrum of the sunlight, it is considered to have potential applications in some optoelectronic devices such as solar cells etc. In order to obtain better performance of CuO-based devices, it is necessary to deeply understand the effect of structural parameters of thin films such as thickness on the physical properties of CuO thin films. In this study, the CuO thin films with different thicknesses were prepared by a facile sol-gel method. The structural, morphological, compositional and optical properties of the samples were analyzed by X-ray diffraction (XRD), scanning electron microscopy (SEM), X-ray photoelectron spectroscopy (XPS), UV-Vis absorption spectra and photoluminescence, respectively. The results show that all samples have a cubic structure regardless of film thickness. However, the photoluminescence behavior that strongly depends on the film thickness is found. When the film thickness is thin, CuO films show a strong violet, green and red co-emission. However, as the thickness

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