

Impact of Bath Temperature on Optical and Morphological Properties of Chemical Bath Deposited CuO thin films

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CuO thin films were deposited onto glass substrates using the chemical bath deposition technique (CBD) by varying the temperature of the solution. The chemical bath technique possesses outstanding advantages like relatively low-temperature growth conditions (<100 °C), low cost, and scalability in the deposition. Morphological and optical properties of the synthesized CuO films were studied as a function of the chemical bath solution temperature. Scanning electron microscopy (SEM) and UV–vis spectroscopy were used to study the morphological and optical properties of the films, respectively. SEM analysis revealed the formation of nano-sheet-like structures at all bath temperatures investigated. The film surface was found to be uniform, and the average nanosheet thickness was found to increase with solution temperature up to a temperature of 85 °C, before it decreased at 90 °C. The lowest bandgap value, 1.32 eV, was reported for the bath temperature at 90 °C.

Keywords: CuO thin films, Chemical bath deposition, Temperature variation