

A Copper Oxide (CuO) Thin Films Deposited by Spray Pyrolysis Method

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Abstract : A simple and low-cost procedure (spray pyrolysis) was used to elaborate copper oxide thin films on ordinary glass substrates. A copper nitrate was used and dissolved in two different solutions (Water, Methanol) S1 and S2 respectively in order to obtain an equal concentration; $C_{S1}, S2 = 0.5M$. The spray pyrolysis deposition made at fixed temperature $T = 500^{\circ}C$ and different volumes of S1 or S2 on the glass substrates. The X-ray diffraction (XRD), scanning electron microscopy (SEM) and UV-vis spectrophotometry were used to determinate the structural, morphological and optical properties of CuO thin films. The X-ray diffraction patterns confirm the presence of the polycrystalline phase of CuO as monoclinic crystal structure with preferential orientation along (110), (002), (111), (200) and (020). Their optical band gaps ranged from 3.95 to 4.02eV for thin films made with S1, and from 1.6 to 1.95eV for thin films made with S2 with a high absorbency in the visible region, which is in agreement with the values of the literature.

Keywords : Copper oxide, Thin films, Spray pyrolysis, Band Gaps, XRD, SEM.