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Influence of Cu-precursor on the morphology and composition of $Cu_{2-x}S$ thin films obtained by chemical spray pyrolysis

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Abstract. Thin films of $Cu_{2-x}S$ were deposited at 260 °C onto TCO (SnO_2:F) glass substrates from aqueous solutions with molar ratio Cu:S = 1:3 by spray pyrolysis technique. Thiourea was used as Sulfur precursor and $CuCl_2$, respectively $Cu(CH_3COO)_2$ acted as Copper precursor. The morphological and the structural characterization of the as-deposited films have been carried out by scanning electron microscopy (SEM) and X-ray diffraction (XRD). Thin, homogenous and relatively uniform films of Cu_2S (chalcocite, JCPDS 84-0206) were deposited from the solutions containing $CuCl_2$ and thiourea, while porous, inhomogeneous and non-uniform films of $Cu_{1.8}S$ (digenite, JCPDS 26-0476) were obtained when $Cu(CH_3COO)_2$ was used as cationic precursor

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