

A study on Cu_xS thin-films deposited from aqueous solution using continuous flow reactor

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Copper sulfide (CuS) has drawn people's attention due to the its excellent optical and electrical properties such as photothermal conversion applications, photovoltaic applications, solar control coatings.

In this study, we have successfully deposited copper sulfide thin films on the substrates using continuous flow reaction (CFR) process that is able to make nice and uniform Cu_xS thin film from an aqueous solution. The aqueous solution contains of copper sulfate and thiourea as copper and sulfur precursor. The morphological characteristics of Cu_xS thin films deposited CFR method were investigated by scanning electron microscope (SEM) and transmission electron microscopy (TEM). Optical characteristics were also confirmed by UV-vis spectroscopy. X-ray photoelectron spectroscopy (XPS) was carried out in order to characterize the chemical composition and structure information of the sample. The thickness of the obtained copper sulfide thin film showed approximately 60 nm under one minute deposition time at 80 °C surface temperature. The estimated band gap was 3.4 eV.