

Two-step electrodeposition of CIGS on molybdenum coated copper substrate

Paper Presenter: Mohsen Saremi¹

Mohsen Saremi¹, Mahdis Nazarbeygi², Negar Sabouhanian³

1- School of Metallurgy & Materials Engineering, Faculty of Engineering, University of Tehran, Tehran, Iran.

2- School of Metallurgy & Materials Engineering, Faculty of Engineering, University of Tehran, Tehran, Iran.

3- School of Metallurgy & Materials Engineering, Faculty of Engineering, University of Tehran, Tehran, Iran.

Corresponding Author's E-mail: saremi@ut.ac.ir

Abstract

Thin film solar cells with chalcopyrite $\text{CuInSe}_2/\text{Cu(In,Ga)Se}_2$ (CIS/CIGS) absorber layers have attracted significant research interest as an important light-to-electricity converter with widespread commercialization prospects. Among different deposition techniques available for the CIGS absorber layer, electrodeposition is an effective and low cost alternative to vacuum based deposition methods. Simultaneous electroplating of Cu-In-Ga-Se is so difficult due to the more negative potential of Ga and it does not come to a reasonable amount. Considerable researches have been done about this subject but there are still some points which needs more work specially on increasing the efficiency, and this work is following such researches. In this study two-step electroplating was used to deposit all four elements in the expected concentration level. Morphology and crystal structure of the films were characterized by X-ray diffraction (XRD) and scanning electron microscopy (SEM) to verify the existence of intermetallics.

Keywords: Solar cells, Chalcopyrite, CIGS, electrodeposition, Morphology

1 -Professor, university of Tehran

2 - Master student of Corrosion and Materials Protection, university of Tehran

3 - Master student of Corrosion and Materials Protection, university of Tehran