

Electro Deposition of β -Phase Cu-Sn Alloy from Aqueous Based Sulphate Solution on Mild Steel for Solar Reflectors Application

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Concentrated Solar power (CSP) systems require reflectors whose reflectance is above 95%. This can be achieved if the plasma frequency of the reflector material falls in the UV region of the solar spectrum. The plasma frequency of $\text{Cu}_{0.86}\text{Sn}_{0.14}$ phase of Cu-Sn alloy system is found to satisfy this condition. This compound exists as β -phase in the Cu-Sn phase diagram. The objective of this work is to deposit on mild steel substrate by using aqueous based sulphate solution. Cyclic Voltammetry and Potentiostatic studies were carried out to determine the equilibrium potential for the deposition of $\text{Cu}_{0.86}\text{Sn}_{0.14}$ phase. Then by using three electrodes (working electrode, counter electrode, reference electrode), the $\text{Cu}_{0.86}\text{Sn}_{0.14}$ phase was deposited on mild steel. The deposited samples were characterized by SEM, XRD and UV-vis spectrophotometer. The electrodeposited film at 0.0608 A constant current using PEG as additive has better adhesion, uniformity than compared with using laprol 2402C as additive. The reflectance of the deposited sample was found to be 23.94%.

Biography:

V. Tejaswini is pursuing B.Tech final year from Mahatma Gandhi Institute of Technology. She had done her project work in Indian Institute of Science, Bangalore. She is very passionate about her studies and is a recipient of Ministry of Steel Chair Scholarship. She had presented various papers in college wise seminars and stood in top position.