

Cathodic electrodeposition of SnS in the presence of EDTA in aqueous media

ABSTRACT

Cathodic electrodeposition in the presence of EDTA in aqueous solution was found to offer some noteworthy improvements in our attempt to synthesise an SnS thin film. EDTA has shown its capacity for improving the longevity of the deposition bath as well as the adhesion of the deposited film on a titanium substrate. Photoelectrochemical analysis reveals outstanding photoactivity of the electrodeposited thin film, while an optical study shows an energy gap of approximately 1.1 eV. The effects of chelating agent were extracted from the results of cyclic voltammetry, photoelectrochemical test, scanning electron microscopy and X-ray diffraction spectroscopy. The latter which displays better defined signals reaffirms the appreciable improvement in the polycrystallinity of the thin film. Analysis of peak locations, coincidentally, confirms that SnS of Herzenbergite form has been obtained.

Keyword: SnS; Tin sulphide; Electrodeposition; Cathodic; EDTA; Semiconductor