

## Electrochemistry of Metal Chalcogenides Semiconductor Materials; Theory and Practical Applications

**Authors :** Mahmoud Elrouby

**Abstract :** Metal chalcogenide materials have wide spectrum of properties, for that these materials can be used in electronics, optics, magnetism, solar energy conversion, catalysis, passivation, ion sensing, batteries, and fuel cells. This work aims to, how can obtain these materials via electrochemical methods simply for further applications. The work regards in particular the systems relevant to the sulphur sub-group elements, i.e., sulphur, selenium, and tellurium. The role of electrochemistry in synthesis, development, and characterization of the metal chalcogenide materials and related devices is vital and important. Electrochemical methods as preparation tool offer the advantages of soft chemistry to access bulk, thin, nano film and epitaxial growth of a wide range of alloys and compounds, while as a characterization tool provides exceptional assistance in specifying the physicochemical properties of materials. Moreover, quite important applications and modern devices base their operation on electrochemical principles. Thereupon, our scope in the first place was to organize existing facts on the electrochemistry of metal chalcogenides regarding their synthesis, properties, and applications.

**Keywords :** electrodeposition, metal chalcogenides, semiconductors, applications

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