

Thematic course: Hydrochemical synthesis of metal chalcogenides films. Part 19.

The films Cu_{2-x}Se : thermodynamic analysis of the formation conditions, the synthesis, composition, morphology

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Abstract

The boundary formation conditions of solid phase of copper(I) selenide and copper(I) hydroxide were defined by means of calculation of ionic equilibrium with using of thermodynamic constants for systems "copper(I) chloride – hydroxylamine hydrochloride – sodium selenosulphate" accounting the formation of crystal nucleus with critical radii. It is experimentally shown that the obtaining of copper(I) selenide films with the thickness of 100 to 400 nm of nonstoichiometric composition Cu_{2-x}Se is possible by hydrochemical deposition. The composition and morphology of the obtained layers were investigated. The research revealed that the as-deposited layers Cu_{2-x}Se consist of crystallites polyhedral shape and have *p*-type conductivity.