

Thematic direction: Hydrochemical synthesis of metal chalcogenide films. Part 7.

Making of PbS–Ag₂S thin solid solution films by the method of ion exchange substitution

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Abstract

The thermodynamic analysis of heterogeneous chemical reaction's realization in PbS_s film – argentum nitrate water solution system is carried out. For the first time by the method of ion exchange substitution of Pb²⁺ on Ag⁺ in PbS films the thin polycrystalline layers of Ag_xPb_{1-x}S solid solutions with Ag content up to 24 atomic % are obtained. The synthesized solid solutions are investigated by the methods of X-ray diffraction, Raman spectroscopy, electron microscopy and optical absorption. The dependence of a structure and morphology of Ag_xPb_{1-x}S films from argentum salt concentration in initial reactionary mixture and duration of ion exchange substitution is established.