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Synthesis of thin film solid solutions $Pb_{1-x}Sn_xSe$ by means of ion-exchange substitution

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Abstract

Thermodynamic analysis of heterogeneous chemical reaction in $PbSe_s$–tin(II) salt aqueous solution system is carried out. For the first time thin polycrystalline films of $Pb_{1-x}Sn_xSe$ solid solutions with tin content up to 15.1 at. % are synthesized by ion-exchange substitution technique. The resulting layers are investigated by means of XRD and SEM analyses. The dependence of $Pb_{1-x}Sn_xSe$ films composition and surface morphology on reaction bath concentrations, temperature and ion exchange duration is established.