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Kinetics of chemical bath deposition of lead selenide from a citrate-ammonia system

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Abstract

Calculation of ionic equilibria using thermodynamic constants in the "lead acetate – sodium citrate – ammonium hydroxide – selenourea" systems taking into account the crystallization factor made it possible to determine the boundary conditions for formation of PbSe and $Pb(OH)_2$. Complex kinetic studies of PbSe deposition in the system were performed along with setting up a formal kinetic equation for the rate of lead salt conversion into selenide and determining the activation energy and partial reaction orders for each component of the reaction mixture. The effect of chemical bath conditions and the reaction mixture composition on the thickness of PbSe films has been shown.