Thematic Section: Physicochemical Research. **Full Paper**
Subsection: Inorganic Chemistry. *Registration Code of Publication:* 14-37-2-1
Publication is available for discussion in the framework of the on-line Internet conference "*Butlerov readings*".
http://butlerov.com/readings/
Contributed: February 20, 2014.

Thematic course: Hydrochemical synthesis of chalcogenide films of metals. Part 18.

Kinetic-thermodynamic analysis of the colloid-chemical deposition conditions and AFM-investigation of SnS films

© **Larisa N. Maskaeva**,[1,2+] **Ekaterina A. Fedorova**,[1] **Anna I. Shemyakina**,[1]
Elena I. Stepanovskih,[1] and **Vyacheslav F. Markov**[1,2]*
[1] *Department of Physical and Colloid Chemistry. FSAEI HPE "Ural Federal University named after the first President of Russia B.N. Yeltsin". Mira St., 19. Ekaterinburg, 620002. Sverdlovsk region. Russia. Phone: +7 (343) 375-93-18. E-mail: mln@ural.ru*
[2] *Department of Chemistry and Burning processes. Ural institute GPS of the Ministry of Emergency Measures of Russia. Mira St., 22. Ekaterinburg, 620022. Sverdlovsk Region. Russia. Phone: +7 (343) 360-81-68.*

*Supervising author; +Corresponding author

Keywords: *ionic equilibriums, boundary conditions of formation, kinetic studies, colloid-chemical deposition, tin(II) sulfide, tin hydroxide, fractal dimension.*

Abstract

The boundary conditions of formation of tin (II) selenide and its hydroxide have been defined by means of calculation of ionic equilibriums with the use of thermodynamic constants for "tin chloride − sodium citrate − sodium hydroxide − thiocarbamide" system, taking into account the crystallization factor. The induction period was detected on the kinetic curves deposition of tin(II) sulfide by thiocarbamide. It demonstrates an active role of colloidal hydroxide component of tin(II) during the formation of a solid phase SnS. AFM-investigation of SnS layers at different stages of growth was carried out using fractal formalism. It has been shown that the nucleation and growth of the SnS films occur by the mechanism of cluster-cluster aggregation.