Full Paper _____ *Thematic Section:* Physicochemical Study.
Registration Code of Publication: 12-30-6-144 *Subsection:* Inorganic Chemistry.
Publication is available for discussion in the framework of the on-line Internet conference "*Butlerov readings*".
http://butlerov.com/readings/
Contributed: August 10, 2012.

Thematic division: Hydrochemical synthesis of films of metal chalcogenides. Part 15.

Enrichment of $Cu_xIn_{1-x}Se_YO_{1-y}$ films with indium by the method of ion-exchange substitution

© **Ekaterina A. Fedorova**,[1] **Stanislav S. Tulenin**,[1]
Larisa N. Maskaeva,[1,2+] **Michael V. Kuznetsov**,[3]
Alexander U. Chufarov,[3] and **Vyacheslav F. Markov**[1]*
[1] *Cafedra of Physical and Colloidal Chemistry. Ural Federal University Named After the First President of Russia B.N. Yeltsin. Mira St., 19. Ekaterinburg, 620002. Russia. Phone: +7 (343)375-93-18. E-mail: v.f.markov@ustu.ru*
[2] *Cafedra of Chemistry and Burning Processes. Ural Institute of State Fire Service EMERCOM of Russia, Mira St., 22. Ekaterinburg, 620062. Russia. Phone: +7 (343) 360-81-68.*
[3] *Institute of Solid State Chemistry. Ural Branch, Russian Academy of Sciences. Pervomaiskaya St., 91. Ekaterinburg, 620990. Russia. Phone: +7 (343) 362-33-56. E-mail: kuznetsov@ihim.uran.ru*

*Supervising author; +Corresponding author

Keywords: *hydrochemical deposition, thin films, copper(I) selenide, indium selenide, ionic exchange.*

Abstract

Thermodynamic analysis of heterogeneous chemical reaction in $(Cu_xIn_{1-x}Se_YO_{1-y})_{(solid)}$-$InCl_{3(aqueous\ solution)}$-system has been carried out. Enrichment of thin films with indium up to 7.6 atomic % in Cu_2Se–In_2Se_3-system has been carried out by the method of ion-exchange substitution. The obtained layers have been investigated by the methods of X-ray analysis and raster electronic microscopy. The dependence of a composition and morphology of the films from duration of a contact of $Cu_xIn_{1-x}Se_YO_{1-y}$ film with indium salt solution has been established.