Full Paper _____ *Thematic Section:* Preparative Chemistry.
Registration Code of Publication: 11-27-16-56 *Subsection:* Inorganic Chemistry.
Publication is available for discussion in the framework of the on-line Internet conference "*Butlerov readings*".
http://butlerov.com/readings/
Contributed: September 2, 2011.

Subject area: Hydrochemical synthesis of chalcogenide metal films. Part 12.

Synthesis of thin-film solid solutions in the CdS-PbS system by ion-exchange substitution technique

© **Vyacheslav F. Markov**,[1,2]* **Natalia A. Forostyanaya**[1+]
Alexey N. Ermakov,[3] and **Larisa N. Maskaeva**[1,2]
[1] *Physical and Colloid Chemistry department. Ural Federal University Named After the First President of Russia B.N. Yeltsin. Mira St., 28. Yekaterinburg, 620002. Russia. Phone: +7 (343) 375-93-18. E-mail: markv@mail.ustu.ru*
[2] *Ural Institute of State Fire Service Russian Emergencies Ministry. Mira St., 22. Yekaterinburg, 620062. Russia. Phone: +7 (343) 378-38-75. E-mail: mln@ural.ru*
[3] *Institute of Chemistry of a Solid State. The Ural Branch of the Russian Academy of Sciences. Pervomaiskay St., 91. Yekaterinburg, 620990. Russia. E-mail: Ermakov@ihim.uran.ru*

*Supervising author; [+]Corresponding author

Keywords: *thin films, cadmium sulfide, lead sulfide, ion exchange, solid solutions of substitution.*

Abstract

Thermodynamic analysis of the ion exchange process at the interface $CdS_{solid}/Pb^{2+}{}_{solution}$ has been performed in the temperature range from 298 to 363 K. In the "film CdS – lead citrate complex" system supersaturated solid solutions $Pb_xCd_{1-x}S$ containing the replacement component (PbS) to 27 mol. % was first synthesized by ion-exchange substitution technique. The resulting layers were analysed using XRD and SEM methods. The dependence of the composition and morphology of solid solutions $Pb_xCd_{1-x}S$ on the temperature and duration of ion exchange has.