Thematic Section: Study the Reactivity. **Full Paper**
Subsection: Inorganic Chemistry. *Registration Code of Publication:* 12-32-12-35
Publication is available for discussion in the framework of the on-line Internet conference "*Butlerov readings*".
http://butlerov.com/readings/
Contributed: November 21, 2012.

Research of zirconium tetrabutoxide hydrolysis in aqueous-alcoholic medium

© **Stanislav A. Onorin**,* **Dmitry A. Kazakov**,+ and **Anna V. Portnova**
Department of Chemistry and Biotechnology. Perm National Research Polytechnic University. Komsomolskiy St., 29. Perm, 614990. Permskiy krai. Russia.
Phone/fax: +7 (342) 239-15-11. E-mail: kazakovbiotech@mail.ru

*Supervising author; +Corresponding author

Keywords: *zirconium tetrabutoxide, butanol, hydrolysis, zirconium dioxide, synthesis, properties.*

Abstract

The results of the study of zirconium tetrabutoxide (ZTB) hydrolysis in water-butanol solution are discussed in the paper. It was shown that the hydrolysis of ZTB in water-butanol solution was accompanied with the formation of zirconium oxohydroxide. The hydrolysis process was realized by the same mechanism as the hydrolysis of titanium tetrabutoxide (TBT). However, the rate of ZTB hydrolysis is significantly higher than TBT hydrolysis and the process occurs at the lower initial concentration of the alkoxide and water content in the reaction medium. For this reason, during ZTB hydrolysis stages of prehydrolysis and intermediate products formation (oxoalkoxide) can not be separated in time as it can be done during TBT hydrolysis. Because of high rate of ZTB hydrolysis the process of zirconium oxohydroxide obtaining is appropriate to realize in a single step, without prehydrolysis. Our study showed the possibility of controlimg the phase formation process by changing the conditions of ZTB hydrolysis – initial concentration of ZTB and ratio $[H_2O]/[ZTB]_0$ in the initial mixture.