Thematic Section: Biochemical Research. **Full Paper**
Subsection: Simulation of Biosynthesis. *Reference Object Identifier* – ROI: jbc-02/15-41-3-147
The article is published as a material of correspondence participation in International Scientific Forum "Butlerov Heritage-2015". http://foundation.butlerov.com/bh-2015/ *(English Preprint)*
Submitted on March 16, 2015.

Theoretical and experimental simulation of lignin biosynthesis

© **Anatoly P. Karmanov**,[1]*+ **Sergey M. Poleschikov**,[2] and **Lyudmila S. Kocheva**[3]
[1] *Laboratory of Biochemistry and Biotechnology. Federal State Institution of Science. Institute of Biology of Komi Science Center of UB RAS. Kommunisticheskaya St., 28. Syktyvkar, 167982. Republic of Komi. Russia. Phone: +7 (909) 120-81-63. E-mail: apk0948@ib.komisc.ru*
[2] *Department of Higher Mathematics. Syktyvkar Forestry Institute (branch) of the Federal State Budgetary Educational Institution of Higher Education "St. Petersburg State Forestry University n.a. S.M. Kirov". Lenin St., 39. Syktyvkar, 167982. The Republic of Komi. Russia. Phone: +7 (922) 581-04-57. E-mail: polsm@list.ru*
[3] *Laboratory of Chemistry of Minerals. Federal State Institution of Science. Institute of Geology, Komi Science Center of UB RAS. Pervomayskkaya St., 54. Syktyvkar, 167982. Republic of Komi. Russia. Phone: +7 (8212) 24-54-16. E-mail: lskocheva@geo.komisc.ru*

*Supervising author; +Corresponding author

Keywords: lignin biosynthesis, mathematical modeling.

Abstract

The results are given of experimental simulation of biosynthesis *in vitro* in the system of per-oxidase hydrogen peroxide–coniferyl alcohol. We revealed a complex system behavior in the course of de hydro polymerization of monolignols and suggested a mathematical model of the process as a system of differential equations. The features of these equations have been discussed. The results of numerical integration performed by the Runge-Kutta-Fehlberg method of the eighth order have been presented.