

Computer simulation of technological processes

© Ekaterina A. Shulaeva,¹⁺ Nikolay S. Shulaev,^{2*} and Julia F. Kovalenko²

¹ Department "Automated Technology and Information Systems"; Department of Informatics, Mathematics and Physics. Branch of the Ufa State Petroleum Technological University in Sterlitamak.

Pr. Oktyabrya, 2. Sterlitamak, 453118. Bashkortostan Republic. Russia.

Phone: +7 (3473) 24-25-12. E-mail: eshulaeva@mail.ru

² Branch of the Ufa State Petroleum Technological University in Sterlitamak. Oktyabrya St., 2. Sterlitamak, 453118. Bashkortostan. Russia. Phone: +7 (3473)24-25-12. E-mail: nshulayev@rambler.ru

*Supervising author; ⁺Corresponding author

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Abstract

This article describes the modeling software complexes are described that allow to determine such parameters of technological processes that cannot be directly measured, but knowledge of which is necessary for conducting chemical processes in optimal modes for a given quality of the product. The article describes the model and calculation of temperature regimes in electrodynamic catalytic reactors, in particular, during the process of dehydrogenation of butenes. The imitational modeling complex of the polymerization of vinyl chloride, which allows to determine the molecular mass distribution of polymer molecules, describes a program for modeling the electrolyzer parameters in the production of sodium hydroxide, chlorine and hydrogen, based on the temperature dependence of the current-voltage characteristic. It is shown that the mathematical model of calculation of thermodynamic processes in electrodynamic reactors allows to determine the technological parameters of the process for the realization of a given temperature distribution, which ensures the maximum yield of the target reaction products with the minimum possible expenditure of energy of electromagnetic radiation. The imitating modeling complex of the polymerization process of vinyl chloride allows to determine the physicochemical properties of polyvinyl chloride in the polymerization process, will help to ensure optimal modes of technological processes, to predict the change in parameters in the event of abnormal situations, which will increase the level of trouble-free functioning.

In the training and monitoring modes of operation with the help of an imitation-simulation complex, it is possible to quickly assess the level of training of personnel, and also, if necessary, to conduct their training on the basis of the modules of virtual reproduction of the technological process included in it.

Using the developed simulation-modeling complex of the process of electrolysis of sodium hydroxide, chlorine and hydrogen production, it is possible to model the temperature dependence of the current-voltage characteristic, which helps to ensure optimal modes of technological processes, to predict the change in parameters in the event of abnormal situations, which will increase the level of trouble-free operation.

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