the isothermal method to 1-4 minutes in the adiabatic method. Because of this, it is possible to increase the performance of the nitration process.

Aim. The purpose of this work is to develop models of the process of high-temperature adiabatic nitration of benzene based on the principles of soft calculations, as well as their computer implementation.

Materials and methods. The main problem in the adiabatic mononitration processes of benzene and its substituted ones is the intensification of mass transfer between phases, as well as the lack of basic data for designing experimental and industrial reactors. Urgent task is to develop mathematical models that could be used in the design of pilot plants, subsequently clarified their options after a series of preliminary studies.

Results and discussion. As a result of the simulation, a "soft" model was developed. This model makes it possible to roughly estimate the residence time limits in order to achieve a high degree of conversion in the displacement reactor during high-temperature adiabatic nitration of benzene.

The model is based on data on the kinetics of heterogeneous nitration in conditions of ideal continuous tank reactor and the parameter characterizing the stratification. His limits are chosen empirically according to experimental data. A simplified cellular model of high-temperature adiabatic nitration was proposed. It based on the assumption of mixing and stratification in each cell and the complete transformation of the emulsion that is not straightened out.

Conclusions. A simplified cell model of high-temperature adiabatic nitration is proposed, which is based on the assumption of mixing and stratification in each cell and complete transformation of the non-stratified emulsion.

COMPUTER IMAGING TECHNIQUES IN ANALYSIS OF THE OPTICAL AND CHEMICAL CHARACTERISTICS OF HAIR

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Introduction. Knowledge of the optical parameters requires by creating of mathematical models of interaction of laser radiation with biological tissues, including human hair. These models can be used in solving important problems of laser diagnosis, therapy etc. There are many publications on methods of measuring optical parameters of biological tissues. But still their structure continues to remain understudied. One of the central places in biological optics is analysis of melanin in hairs. But existing chemical methods require large time and costs. Therefore, the development of new methods of determining the content of melanin is very crucial.

Aim of work is study methods of computer analysis of the optical characteristics of the hair to assess the content of melanin in the hairs.

Methods of research. Subjects of researchs were the hairs of men and women in thel ages from 17 to 80 years. The study consisted of two parts:

1) The use of computer imaging techniques to measure the diameter of the hair by diffraction methods.

2) Computer analysis of hair color composition of the image in order to finding of parts which is relating to melanin. The image hair (dark, light, red, gray) decomposed into three parts – red, blue, green for this aim. There were measured the contribution of each of these parts, and was determined the content of melanin.

Results of researches. Studies have shown that the analysis of the contribution of red, blue and green spectrum band hair can set the content of melanin. The features and size of optical parameters hair types.

Conclusions. It is shown that the use of optical methods for studying the interaction of optical radiation with hair and computer image processing provides an estimate of hair melanin content, which is important for diagnosis and treatment.