Table 1. The dependence of the ABSA`s quality from temperature

Parameters	Mode 1	Mode 2	The original value (manufacturing data)	Mode 3	Mode 4	Mode 5
t_1, °C	34	33	32.1	31	30	29
t_2, °C	33.5	32.5	31.5	30.5	29.5	28.5
unsulfonated residue, % mass	1.94	1.91	1.89	1.86	1.84	1.82
ABSA, % mass	95.78	95.82	95.84	95.88	95.91	95.93

Studies were conducted with using process data and the results of tests from the laboratory (GC-MS, IR spectroscopy), and specially the developed mathematical model.

The analysis of the composition` feedstock was done and its impact on the quality ABSA was evaluated. It was revealed that the high content of aromatics leads to a decrease alkyl benzene sulphonic acid in the final product. This is because the high viscosity components are formed in the sulfonation reactor. Figure shows the dependence of the ABSA`s number from the high-viscosity component.

On the next step it is showed the effect on the quality of the finished product from temperature`s feed and the cooling water flowing in the sulfonation reactor. The results of model calculations are presented in the table.

It was found that the decrease in temperature is beneficial to ABSA because the number of unsulfonated residue was decreased.

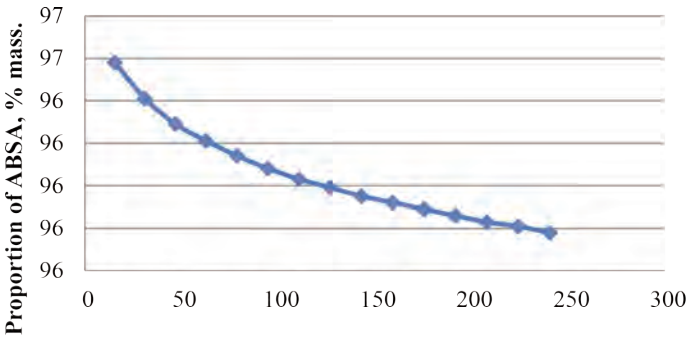


Fig. 1. *The dynamics of changes in the ABSK`s number the accumulation of highly viscous components in the reactor of sulfonation*

As a result of studies were made recommendations on the intensification of production LABS.

References

1. *http://www.acmite.com/market-reports/chemicals/global-surfactant-market.html.*
2. *Bannov P.G., Refining processes. / P.G. Bannov.– M.: TsNIITEneftehim, 2001.– P.625.*

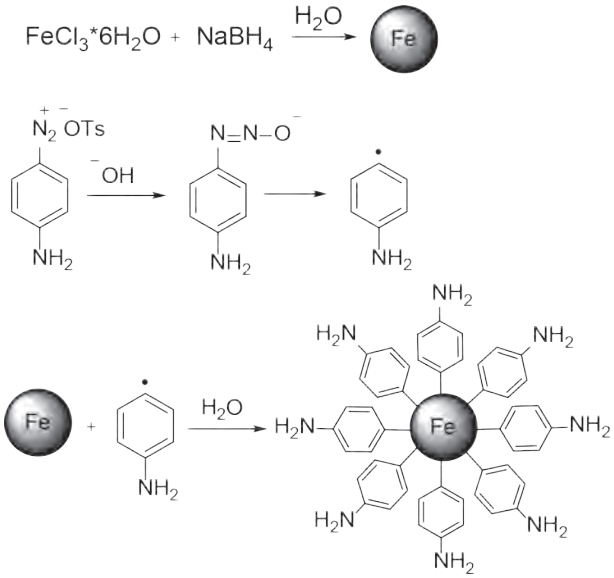
SYNTHESIS OF Gd-BASED MRI CONTRAST AGENT

V.V. Kurtukov, O.A. Guselnikova, A.A. Olshtrem, A.Di. Martino
Scientific supervisor – PhD, Associate Professor, P.S. Postnikov
Linguistic advisor – PhD, Associate Professor, I.A. Matveenko

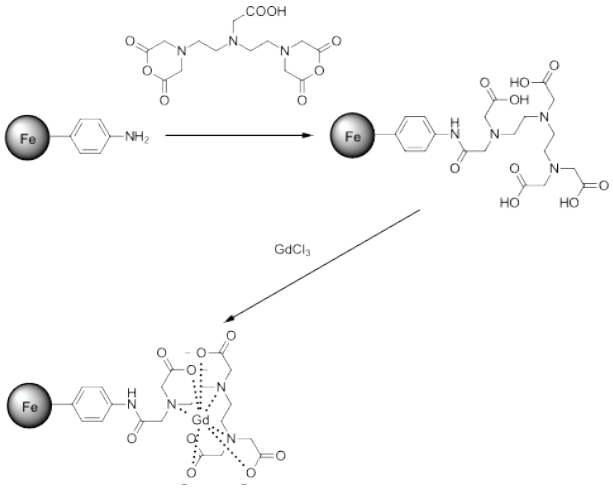
National Research Tomsk Polytechnic University
634050, Russia, Tomsk, 30 Lenin Ave., kurtukov@tpu.ru

In the last decades, many researches have been focused on magnetic nanoparticles with different functional groups attached to them. Such materials have a wide range of applications in pharmacological and medical spheres, such as targeted drug delivery, magnetic resonance imaging (MRI), production of biosensors and catalysis [1]. The scientific group of P.S. Postnikov has developed a new method for synthesis of stable zerovalent iron (ZVI) nanoparticles (NPs), coated with aryl groups, using aromatic diazonium salts (ADS) [2]. The process is described in Scheme 1.

Now that a reliable synthetic method for production of nanoparticles was acquired, it was decided to develop a procedure for acquisition of a MRI contrast compound, using aryl-coated AVI NPs as



Scheme 1. *Synthesis of ZVI NPs using p-aminobenzenediazonium tosylate*



Scheme 2. *Synthesis of Gd-based MRI contrast compound*

base. Gadolinium (Gd) was chosen as a main contrast agent due to its excellent magnetic properties [3] and ability to form chelates. It was agreed to use diethylenetriaminepentaacetic acid (DTPA) anhydride to form a strong chelate with Gd because it is fairly easy attached to a free amine group of the ADS. The scheme of a process is shown in Scheme 2.

Such substance could become a base for developing new theranostic agent and further research in utilization of ZVI NPs in medical and pharmaceutical fields.

References

1. *O.A. Guselnikova, A.I, Galanov, A.K. Gutakovski, P.S. Postnikov // Beilstein J. Nanotechnol, 2015.– 6.– 1192–1198.*
2. *Guselnikova O.A., Gromov M.V., Galanov A.I. // Advanced Materials Research.– Trans Tech Publications, 2014.– T.1040.– C.309–313.*
3. *Ya.N. Ertas, N.N. Jarenwattananon, and L.-S. Bouchard // Chem.Mater., 2015.– 27.– 5371−5376.*

THE TESTING OF A KINETIC MODEL OF CATALYTIC CRACKING IN THE "C-200" SECTION OF THE KT-1/1 INSTALLATION OF OIL REFINING PLANTS IN KAZAKHSTAN

G.Y. Nazarov[1], G.R. Burumbaeva[1], G.J. Seytenova[2]
Scientific Supervisors – PhD, Professor, E.D. Ivanchina[1]; PhD, Professor, E.N. Ivashkina[1]
Linguistic Advisor – Senior Lecturer, O.V. Mikhailova[1]

[1]National Research Tomsk Polytechnic University
Russia, 634050, Tomsk, 30 Lenina ave.

[2]Pavlodar State University after S. Toraigyrov
Kazakhstan, burumbaeva.galiya@gmail.com

The Strategy of the development of the Republic of Kazakhstan until 2030 emphasizes the oil and gas industry, making energy resources a number one priority. This program is the basis for improving the competitiveness of the oil and gas industry of Kazakhstan [1].

Nowadays the Republic of Kazakhstan has three oil refineries – the Atyrau Refinery, the Shymkent Refinery and the Pavlodar refinery, for which the increase in the depth of crude oil refining is an urgent task.

The aim of this work is to test the kinetic model of the process of catalytic cracking in the Section "C-200" of the installation KT-1/1 of the Pavlodar