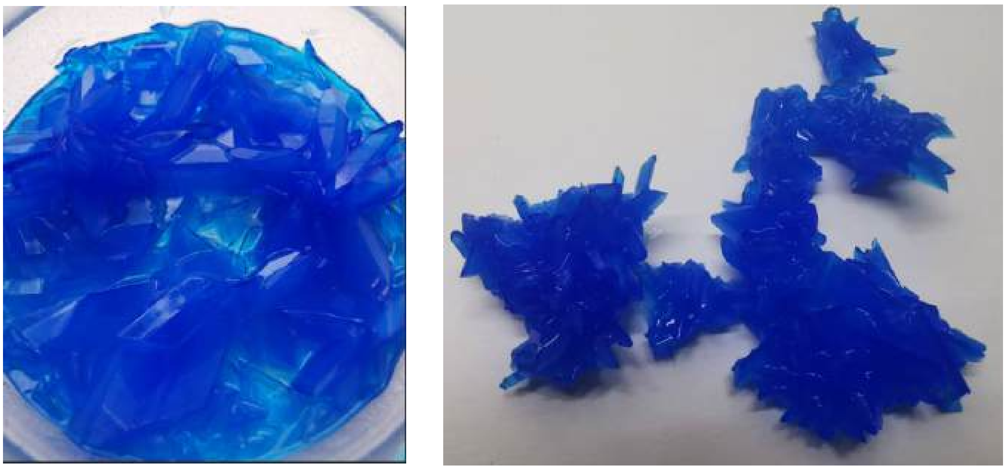

Fig. 1. *$CuSO_4 \cdot 5H_2O$ crystals obtained in step 1*

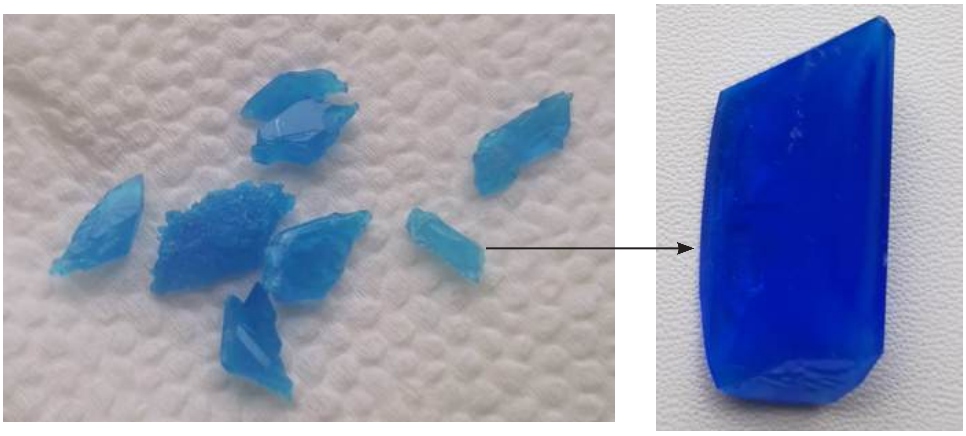

Fig. 2. *$CuSO_4 \cdot 5H_2O$ crystal obtained in step 2*

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INFLUENCE OF STABLE GAS CONDENSATE ZEOFORMING TECHNOLOGICAL PARAMETERS ON THE INVOLVEMENT OF OBTAINED PRODUCTS INTO COMPOUNDING OF COMMERCIAL GASOLINES

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World market demonstrates the increase of demand for motor gasoline [1], the most important indicator of which is the research octane number (RON). A full-fledged non-trivial method for producing motor gasoline, which is the compounding of stable gas condensate (SGC) on-zeolite processing products, also known as zeoformates (Z), is considered in this work.

Using the software products called "UniChrom" and "Compounding" [2], the characteristics and composition of the Zs obtained by varying the on-zeolite processing technological parameters, such as: temperature, pressure and flow rate, were calculated on the basis of detailed hydrocarbon analysis.

Zs designations and the corresponding sets of on-zeolite processing technological parameters are given in the Table.

Using the "Compounding" software product, optimal formulations for compounding Russian standardized 92-octane gasoline were created. These optimal formulations provide both maximum possible involvement of Zs and minimal involvement of such expensive components as toluene and MTBE. The characteristics and composition of the resulting motor gasolines meet the requirements of current Russian standards. The resulting formulations are given in the Figure.

As the temperature of on-zeolite processing catalyst increases, there is a decrease tendency for the possibility of involving Zs due to an increase in the content of aromatic hydrocarbons (HCs) in composition of Zs.

Along with increasing pressure of on-zeolite processing, there is also a decrease tendency of the Zs involvement possibility due to an increase of saturated vapor pressure (SVP).

Parabolic form of flow rate dependency can be also explained with the impact of SVP. In the beginning part of flow rate increase from 0.33 ml/min to 0.50 ml/min, the SVP increase can be explained with an increase in the n-paraffins content. A further flow rate increase to 0.67 ml/min leads to a SVP decrease. This results in n-paraffins content decrease, which in its term leads to increase of the possibility of Zs involvement.

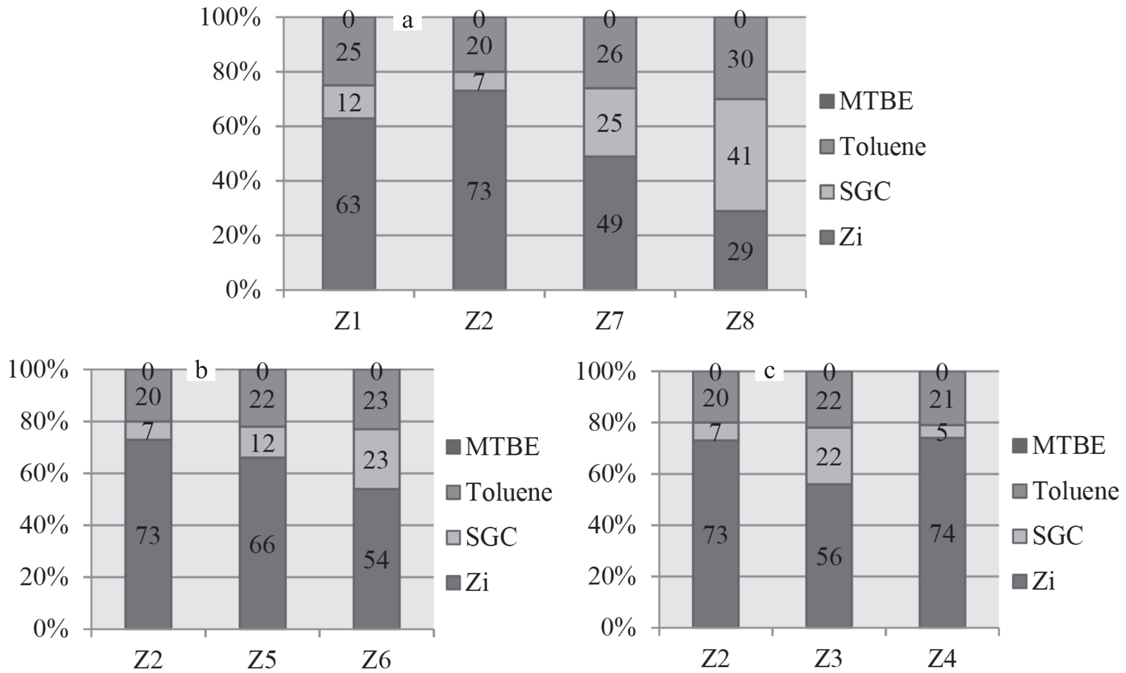

Fig. 1. *Involvement (% wt.) of components in the compounding formulations of Russian standardized 92-octane gasoline in dependence on the on-zeolite processing technological parameters: a) temperature; b) pressure; c) flow rate*

Table 1. Zs designations and sets of on-zeolite processing technological parameters

Designation	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8
Temperature, °C	350	375	375	375	375	375	400	425
Pressure, bar	2.5	2.5	2.5	2.5	3.5	4.5	2.5	2.5
Flow rate, ml/min	0.33	0.33	0.50	0.67	0.33	0.33	0.33	0.33

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MOLECULAR-MASS DISTRIBUTION OF n-PARAFFINS IN DIESEL FUEL AS A FACTOR DETERMINING THE EFFECTIVENESS OF DEPRESSANT ADDITIVES

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Studying the effectiveness of depressant additives (DA) in diesel fuels (DF) is one of the important tasks in their production. The main factor that influences the action of the additive is the interaction of the additives with n-paraffin hydrocarbons in the fuel composition. The mechanism of action of the additives is directly related to the amount of n-paraffins contained in the fuel, since additive molecules are deposited on nascent n-paraffin crystals and prevent their growth and aggregation [1].

In this work, using the Chromato-Mass-Spectrometry method, the molecular-mass distribution of n-paraffins in the composition of DF was determined, presented in the Figure.

Based on the data presented in the Figure, it can be seen that the content of lighter n-paraffins is higher in DF1 sample, and the content of heavier n-paraffins predominates in DF2 sample.

Next, various individual n-paraffin hydrocarbons were added to mixtures of the studied DF samples with a commercial DA: $C_{16}H_{34}$ (C), $C_{17}H_{36}$ (HD), $C_{21}H_{44}$ (HS) and $C_{22}H_{46}$ (D) in concentrations of 1, 3 and 5 % vol. Results of changes in the effectiveness of DA with the addition of n-paraffins at a concentration of 3 % vol. in relation to cloud point (Cp), cold filter plugging point (CFPP) and pour point (Pp) are presented in the Figure.

Based on the results of the studies, it was established:

1. With regard to Cp, the addition of heavy n-paraffins in the case of the presence of a large amount of light n-paraffins in the initial sample does not change the effectiveness of the additive; otherwise, the addition of heavy n-paraffins impairs the effectiveness of the additive.

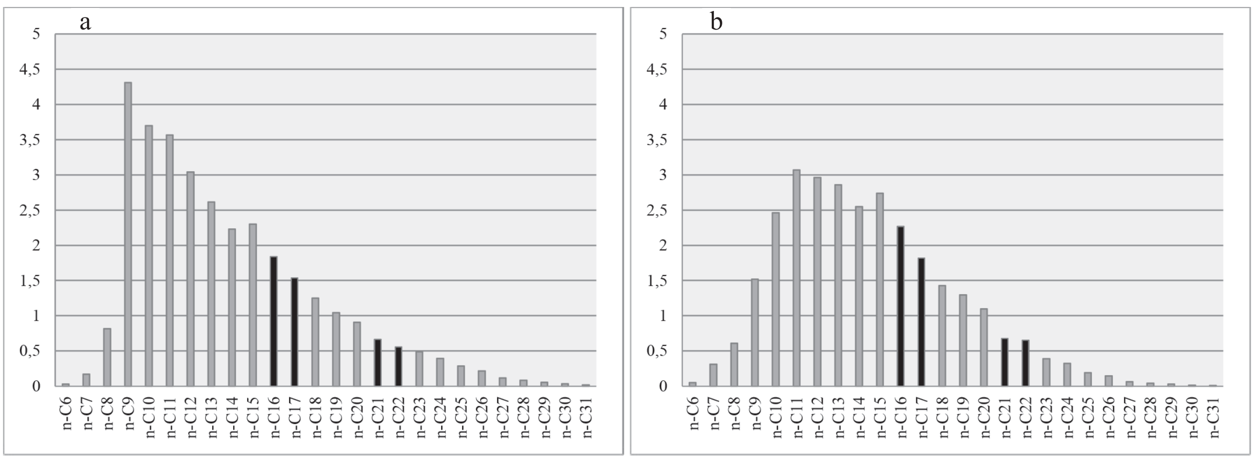

Fig. 1. *Molecular-mass distribution of n-paraffin hydrocarbons in the composition of samples: a) DF1, b) DF2*