

**Table 1.** Pour point of blends

Blends number	PP, °C					
	Concentration of Add, c.u.					
	0.0	0.5	0.7	1.0	1.5	2.0
No. 1	-15	-39	-49	-54	-55	-55
No. 2		-45	-45	-45	-52	-50
No. 3		-40	-41	-42	-45	-46

The best result is observed when using Add No. 2 at a concentration of 1.5 c.u. (this concentration is optimal). In this case, the temperature depression was 37 °C relative to the original sample and 7 °C relative to the sample with the Add concentration recommended by the manufacturer.

With an increase in the concentration of Add No. 3 PP of the blends decreases and hits a low in the studied range at a concentration of 2.0 c.u. The temperature depression was 31 °C relative to the

original sample and 4 °C relative to the sample with a concentration recommended by the manufacturer, and 1 °C relative to the sample with a concentration of 1.5 c.u., so the concentration is 1.5 c.u. is optimal.

The use of all Adds made it possible to significantly reduce PP of DF. For a blend of Add No. 1, the optimal concentration is 1.0 c.u., for blends of Add No. 2 and No. 3 – 1.5 c.u. The best result was caused by the addition of Add No. 1.

## References

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## REGULARITIES OF FEEDSTOCK CONSUMPTION INFLUENCE ON THE DEPTH OF STABLE GAS CONDENSATE PROCESSING ON ZEOLITE CATALYST

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The rational using of hydrocarbons recourses problem continues to be actual due to the growing share of hard-to-recover reserves, shifting of oil and gas production capacities to the northern latitudes and, as a result, the cost of hydrocarbons production increasing. Meanwhile, the last decade, despite the decline in 2022, is characterized by an increase in natural gas production.

Stable gas condensate (SGC) is a by-product of natural gas processing process. SGC can be used to produce motor gasoline by processing it on a zeolite catalyst (zeoforming process). A distinctive feature of zeoforming is its profitability at low capacities (30 thousand tons/year) [1].

Under the zeoforming process, conditions light hydrocarbons evaporated into the gas phase and re-

acts with products formation on the catalyst's surface.

This work describes the influence of SGC contact time with the catalyst during zeoforming on the products composition and the depth of feedstock conversion.

The processing of the SGC sample was carried out on a flow laboratory reactor equipped with a thermally insulated box with a heating element and a water-cooled separator at the outlet for the reaction products separation. The temperature was maintained by a heater at 400 °C and the pressure was maintained at 3.5 bar (abs.) with weak flow of nitrogen. The feedstock flow rate was controlled by a plunger pump. The set of experiments was carried out at feedstock flow rate of 0.33; 0.50; 0.67; 1.00;

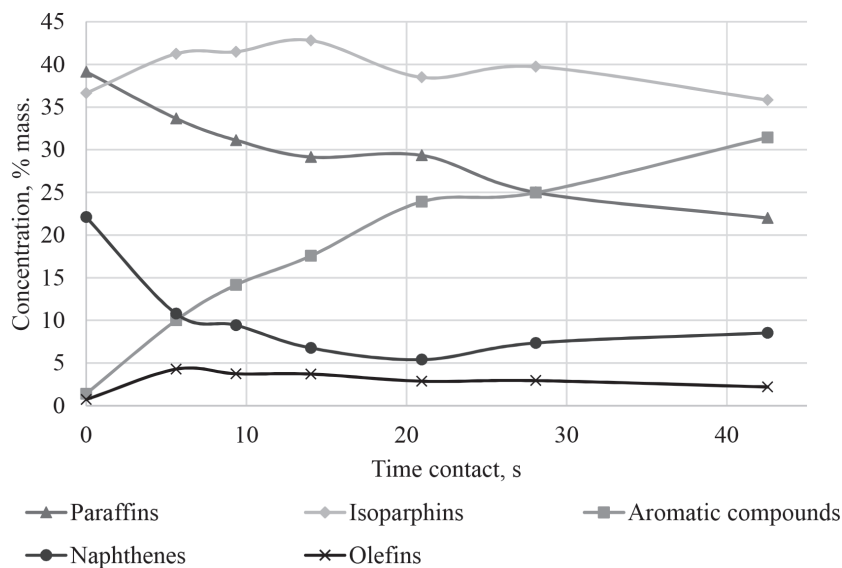


Fig. 1. Influence of contact time for the hydrocarbons concentration

1.50; 2.50 ml/min to study the contact time effect on the depth of processing.

The contact time was calculated as the ratio of the bulk catalyst volume to the gas phase volumetric flow rate.

The liquid phase composition separated at the outlet of the reactor in the steady-state conditions was determined by gas chromatography in accordance with the requirements standard [2].

Figure below shows the contact time influence for the hydrocarbons concentration.

Based on the figure analysis it can be seen that increase in contact time provide increase in the feedstock processing depth, which is expressed

in a decrease in the concentration of paraffins and naphthenes (these groups react with the formation of aromatic and isoparaffinic hydrocarbons). The olefins concentration practically does not depend on the contact time and amounts to 2–4 wt %, i. e. are intermediate compounds. Thus, the main reactions during zeoforming are the feedstock isomerization and aromatization reactions. Cracking reactions also take place with the formation of olefins and light hydrocarbons, which are separated as a gas stream after the separator.

The obtained kinetic curves will be used in the development of a group kinetic model of zeoforming.

## References

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2. USS 32507-2013 "Motor gasolines and liquid hydrocarbon mixtures. Determination of individual and group hydrocarbon composition by capillary gas chromatography".

## APPLICATION OF COMPUTATIONAL FLUID DYNAMICS METHODS TO INTENSIFY REACTOR OPERATION IN THE CATALYTIC CRACKING PROCESS

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Gasoline is presently one of the most important products of oil-processing industry. It is mainly used as automotive fuel. According to experts [1],

its demand is forecast to climb. To increase gasoline products catalytic cracking is used. Catalytic cracking is the process in which long-chain hydrocarbons