

At the next stage of the work, a list of theoretically possible reactions for converting feedstock into products was compiled for the selected hydrocarbons [3, 4].

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RESEARCH OF THE ASSOCIATED PETROLEUM GAS CONVERSION INTO AROMATIC HYDROCARBONS ON A ZEOLITE CATALYST

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To begin with, a significant portion of associated petroleum gas was flared or used as the process fuel. Currently, due to the shortage of oil raw materials and toughening the requirements for environmental safety of enterprises and field production sites, the problem arises of developing processes for sustainable use of associated petroleum gas, such as conversion into various valuable products [1].

The aim of the work is to develop a formalized scheme of associated petroleum gas chemical conversion on a zeolite catalyst. To achieve this goal, the following tasks were set: the collection and processing of available information, as well as the formation of a table with data for the development of a mathematical model; compiling a list of possible reactions taking into account the characteristics of the catalyst. The object of research is the process of conversion of gaseous methane-ethane and liquid propane-butane fractions on a zeolite catalyst.

Zeolites are composed of cations of silicon and aluminum surrounded by four oxygen anions. During the catalytic process, the appearance of Brønsted Acids sites that are highly active in isomerization and cracking reactions occurs [2]. The presence of acid sites suggests that hydrocarbon

Thus, based on the literature review and thermodynamic analysis of the ongoing reactions, a group formalized scheme for the conversion of SGC hydrocarbons on a zeolite catalyst was compiled. The formalized scheme is shown in the Figure.

conversions on zeolite catalysts occur via an acid-base mechanism.

It should be borne in mind that the presence of ethylene in the initial mixture leads to a significant increase in the yield of aromatic hydrocarbons since ethylene has a high reactivity [3]. To this, we can add that the presence of ethylene in the initial mixture also allows immediately, when the mixture is loaded into the reactor, parallel to the first stage, the second stage is carried out, at which hydrogen redistribution reactions in unsaturated hydrocarbons occur with the formation of aromatic hydrocarbons.

In addition to the above transformations, acid dehydrogenation, dehydrocyclization, oligomerization, isomerization and alkylation reactions can also occur on acid sites.

Moreover, attention should be paid to the issue of catalyst deactivation Brønsted Acids because of coke formation. The process of coke formation is quite intense during cracking reactions, but it practically does not occur in hydroisomerization reactions. Since in the case of conversion of associated petroleum gas, most of the reactions are related to hydroisomerization. It can be said that catalyst deactivation will not occur intensively; however, in order for the model to be applicable for calculating

the process under long-term operation of the catalyst, it is necessary to take into account the coke formation reaction in the conversion scheme.

Thus, to develop a formalized conversion scheme during the conversion of associated petroleum gas, the following reacting components were

identified: methane, ethane, ethene, propane, butane and the following types of reactions: hydrogen redistribution, dehydrogenation, dehydrocyclization, oligomerization, isomerization and alkylation, coke formation.

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INVESTIGATION OF THE INTERACTION OF DIAZONIUM SALTS WITH ORGANOZINC REAGENTS

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Arendiazonium salts are one of the most widespread reagents in organic synthesis and the synthetic equivalent of CAr-electrophilic synthon [1]. Diazonium often act as “super electrophiles” in Pd-catalyzed transformations [2]. However, the reaction of diazonium salts with other types of C-nucleophiles, such as, Zn-organic reagents, not studied enough. In this paper, we tried to show this issue and to study the reaction of the interaction of diazonium salts with diethylzinc.

It has been found that arendiazonium tosylates smoothly react with diethylzinc at low temperatures. Nevertheless, the analysis of the products revealed the formation of a number of products of the hydrazine series (Fig. 1). Thus, at the moment, we are sure

that diazonium salts tend to react with organometallic reagents as N-centered electrophiles.

At the same time, the simplicity of the process and the possibility of producing hydrazines under mild conditions can expand the arsenal of methods for synthesizing hydrazines and also become the basis for the creation of new heterocyclization methods leading to the formation of valuable nitrogen heterocycles.

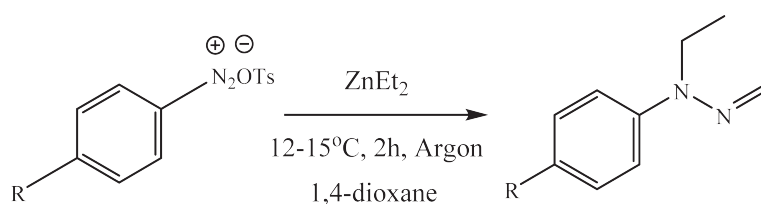


Fig. 1. The synthesis scheme of the interaction of arendiazonium tosylate and diethylzinc

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