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EFFECT OF THE DURATION OF THE REACTION ON THE CATALYTIC CONVERSION OF METHYL CHLORIDE

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ABSTRACT

This article discusses the thermal transformation of hydrocarbons in the pyrolysis process, on the conditions for the formation of free radicals and the basic reactions that take place in them.

Today, fundamental reforms and changes in the economic sphere have been implemented in our country increased, and they are the path of national development that was firmly chosen by the will of our people is being continued on a large scale and consistently. World financial and economic crisis despite this, the rate of growth in our economy is ensured. The life of a growing population and the level of well-being remains stable. Accepted in our country is important state programs are bearing fruit.

Acceleration of socio-economic development, people's standard of living and natural, mineral-raw, industrial, rural areas of each region to increase their income ensuring comprehensive and effective use of economy, tourism and labor potential issues such as finding and implementing alternative energy sources that do not harm the environment, while ensuring the rational use of energy raw materials increases the urgency of the main tasks to be carried out in the direction of For this reason reduction of anthropogenic impact on the environment and production of high-quality fuel ecologically clean in the preparation of commercial fuels for the transport sector in our country. Research on the use of energy resources is one of todays priority issues.

In the past five years, i.e. in 2017-2021, within the framework of the Action Strategy of the industry leading industries (textiles, electrical engineering, automobile industry, building materials industry, chemical and petrochemical industry, agricultural engineering, energy networks) development strategies were adopted. In this regard, "Five years of success"Reforms are the beginning of new development."

Today, the legal basis of this policy is the Republic of Uzbekistan Development of the Republic of Uzbekistan No. PF-4947 of the President of 07.02.2017.

The III-priority direction of the Strategy of Actions on "high-tech re based on in-depth processing of production networks, first of all, local raw materials to rapidly develop the production of finished products with high added value further modernization of the industry by transferring it to a qualitatively new stage and New as a continuation of the reforms started within the framework of "diversification". The third development strategy of Uzbekistan for 2022-2026 direction - the national economy, its growth rates at the level of contemporary requirements priority tasks for the development of the fields of chemistry and gas chemistry reflected in the direction of development and increasing the level of natural gas processing. In its place, it is worth saying that the effectively implemented reforms are next is a guarantee of success.

Olefins, which are important raw materials of the polymer industry, have different forms. Hydrocarbons are pyrolyzed. To the raw material type of pyrolysis technology there are different options, depending on which: using a solid heat carrier; very in the environment of heated water vapor; in electric discharge tubes; in voltage arcs; catalyst. The most common in the system and industry are systems conducted in tubular furnaces. The raw material base of the organic synthesis industry is in individual countries and regions is closely related to the structure of the fuel-energy balance. Therefore, organic synthesis the modern level of development of the "petrochemical" (or, olefin) industry evaluated according to the development indicator.

The most common method of ethylene production in modern petrochemical industry is pyrolysis and the main links of the technological system of pyrolysis of hydrocarbon raw materials are extensive improved in scale. Technological in the construction of pyrolysis reactor-furnace blocks solutions for the maximum output of the target products and, above all, the process of obtaining ethylene to carry out under very difficult conditions (in terms of temperature and raw material separation time) focused on taking into account.

Thermodynamic calculation of pyrolysis of hydrocarbons for the production of lower olefins. With the results of the implementation of the corresponding process, the temperature is increased to 600-7000C. A much higher temperature is required for the production of ethylene than for the production of propylene will be. The upper limit of the process temperature is the production of acetylene to an insignificant amount is limited to the value that will be It is consistent with data from thermodynamic calculations pyrolysis process at low pressure, close to atmospheric pressure, and water vapor to raw materials should be carried out under conditions of sufficient addition. The laws of thermal decomposition of hydrocarbons are thermal to a certain extent it changes when passing from cracking conditions (470–540 0C) to pyrolysis conditions (700–1000 0C). Temperature affects the mechanism of the process and the composition of the products. At present, methane to alternative methods of obtaining ethylene from methane such as oxycondensation, MTO process and catalytic pyrolysis of methyl chloride is counted. Expanding the raw material base of the ethylene industry and methane in it assimilation was carried out in the following directions:

1. Partial oxidation of methane

$2CH4 + O2 \rightarrow C2H4 + 2H2$

2. Conversion of methane, synthesis of methanol from it and production of ethylene from it

$2CH4 + H2O + O2 \rightarrow CO + CO2 + 5H2$

$CO + CO2 + 5H2 \rightarrow 2CH3OH + H2O$

$nCH3OH \rightarrow C2H4 + C3H6 + C4H8 + CnH2n+2 + nH2$

3. Synthesis of methyl chloride from methane and its pyrolysis

nCH4 + nHCl + n/2 O2 → nCH3Cl + nH2O

nCH3Cl → C2H4 + C3H6 + C4H8 + CnH2n + CnH2n+2 + nHCl

The method of obtaining alkenes by catalytic pyrolysis of methyl chloride is a chemical method of methane (natural gas), processing based. In this process, methyl chloride is obtained by first oxychlorination of methane and then, in the second stage, methyl chloride is catalytically pyrolyzed and lower alkenes are obtained.

Catalytic pyrolysis of methyl chloride to obtain C2-C4-alkenes is currently high silica zeolites have high catalytic activity [1-5].

Not only the catalytic pyrolysis of methyl chloride of high-silica zeolites their composition, but also the size of their pores is of great importance. Many according to studies [3-5] high silicon zeolites, metals such as Co, Fe, Mn, Mg when modified with, the duration of the catalyst increases, which is due to this metals are explained by reducing the degree of coking of the catalyst. Experiments on catalytic pyrolysis of methyl chloride were conducted in a flow reactor.

The composition of the reaction system in the "Krystal-5000.1" chromatograph with a flame-ionization detector done. Different technological parameters (temperature, the influence of volumetric flow rate of methyl chloride) was studied. The effect of temperature on the volumetric rate of methyl chloride is 1500 h-1400-5000S studied between As a result of experiments, when the temperature increases from 4000C to 5000C the conversion of methyl chloride initially increases. If the temperature increases during the experiment catalyst activity is sharply reduced. Ethylene formation selectivity with increasing temperature decreases. As a result of the experiments, the conversion of methyl chloride in the range of 420-4400C is 65% and the selectivity of lower alkenes was found to be 77%.

Catalyst with increasing temperature and increasing catalyst operating time its catalytic activity decreases due to its deactivation. As a result of research, it was found that. From 4200S to 4400S, the initial conversion of methyl chloride is 80-85% is enough. This can be seen in Figure 1 below.

Effect of volume velocity on the pyrolysis process of methyl chloride at 4200C 450-4800 h-1 studied between Conversion of methyl chloride with decreasing catalyst volume increases. The formation of C2-C3-alkenes with an increase in the volume rate of the initial raw materials overall selectivity increases. The catalyst is noted above after 120 hours of use the value of the quantities decreases. The volumetric velocity value of methyl chloride as a result of experiments 1200 hours-1 conversion of methyl chloride is 65%, formation of C2-C3 alkenes the total selectivity was proved to be 77%. During the first 120 minutes of the catalysts in the range from 4200S to 4400S when working, the conversion of methyl chloride decreases from 85% to 65%. The next 12 minutes it was determined that the conversion of methyl chloride decreased from 65% to 18%. Temperature with the increase, the initial selectivity for ethylene increases somewhat, and at this time for propylene relative selectivity almost does not change. In the conditions of high temperatures of pyrolysis, the molecules are very high the

concentration of radicals increases with energy saturation. This leads to a decrease in chain length and radical - leads to an increase in the role of non-chain decomposition. Radical-chain some hydrocarbons are not related to each other in non-destructive decomposition breaks down. An increase in temperature resulted in higher activation energy values accelerates reactions, as a result of which the ratio of radicals between different reactions will change. Radicals vs. low-energy coupling reactions the importance of energy-intensive reactions of decomposition increases.

Alkenes temperature also affects the secondary reactions of its changes. Activation of alkenes characterized by much lower values of energy carried out with higher activation energy compared to condensation reactions. The decomposition of increasing alkenes accelerates with increasing temperature and finally temperature determines the ratio between the main groups of pyrolysis reactions.

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