Секция 7 Химия и химическая технология на иностранном языке

STABLE GAS CONDENSATE AS RAW MATERIAL OF THE ZEOFORMING PROCESS: POSSIBILITIES OF USE

A.A. Altynov, I.A. Bogdanov
Scientific supervisors – PhD, associate professor M.V. Kirgina

National Research Tomsk Polytechnic University
634050, Russia, Tomsk, 30 Lenin Avenue, andrey_altun@mail.ru

The most important trends in recent years, observed in the oil production and refining industry, are the increase in consumption of light oil products and the toughening of requirements for the utilization of products obtained in the process of oil production.

The use of stable gas condensate (obtained as a by-product in the oil production) in the process of motor fuels production allows, on the one hand, to increase feedstock base in the production of light petroleum products, on the other hand to effectively utilize the condensate.

The most optimal process for the use of condensate as feedstock is the zeoforming process.

Zeoforming process is industrial technology for the production of high-octane gasolines on zeolite catalysts, developed in Russia by the scientific and engineering center «Zeosite».

The feedstock of zeoforming process for the production of high-octane gasolines is gasoline fractions with an end-boiling temperature of up to 200 °C.

Zeoforming process is designed for the implementation on small-tonnage installations of motor fuels production.

At the same time, it is possible to produce gasoline brands from

AI-80 to AI-95, which meet the requirements of USS 32513-2013 «Automotive fuels. Unleaded petrol. Specifications» [1] without addition of any additives and additional compounding. For assess the possibility of using gas condensate as the feedstock of zeoforming, a laboratory study of its composition and physicochemical properties was carried out.

The density of condensate at 20 °C is determined by USS 3900-85 «Petroleum and petroleum products. Methods for determination of density» [2] is 0.719 g/cm^3. Sulfur content in accordance with USS 32139-2013 «Petroleum and petroleum prod-

Table 1. Fractional composition of stable gas condensate

Volume, %	T, °C	Volume, %	T, °C	Volume, %	T, °C
IBP	28	30	46	80	85
5	34	40	51	85	92
10	36	50	57	90	103
15	38	60	64	95	133
20	41	70	73	FBP	140

Table 2. Group composition of stable gas condensate

Hydrocarbon group	Content, % vol.
n-paraffins	46.30
iso-paraffins	37.60
naphthenes	15.26
olefins	0.14
aromatics	0.59

ucts. Determination of sulfur content by method of energy dispersive X-ray fluorescence spectrometry» [3] is 30 ppm.

Determination of the condensate fractional composition was carried out in accordance with USS 2177-99 «Petroleum products. Methods for determination of distillation characteristics» [4], the results are presented in Table 1.

Chromatographic analysis was performed to determine the hydrocarbon composition of the condensate. Group composition of condensate is presented in Table 2.

According to the data presented in Tables 1–2, the condensate has properties similar to straight-run gasoline.

Thus, based on the results of the research, it can be concluded that the stable gas condensate can be used as the feedstock of the zeoforming process.

References

1. *USS 32513-2013 «Automotive fuels. Unleaded petrol. Specifications».*
2. *USS 3900-85 «Petroleum and petroleum products. Methods for determination of density».*
3. *USS 32139-2013 «Petroleum and petroleum products. Determination of sulfur content by method of energy dispersive X-ray fluorescence spectrometry».*
4. *USS 2177-99 «Petroleum products. Methods for determination of distillation characteristics».*

STUDY OF THE MECHANISM OF COKE FORMATION FROM OIL RESIDUE AND COAL PITCH

J.D. Appiah, P.L. Shapovalov

Scientific adviser – Phd, director of oil and gas institute F.A. Buryukin

Siberian Federal University Oil and Gas Institute

660041, Russia, pr. Svobodnyy 82, inig@sfu-kras.ru

Aim

To find out how temperature and residence time affects the yield and characteristics of coke formed from FCC, tar and coal pitch at standard conditions.

Introduction

The yield and characteristics of petroleum coke depends on the feedstock characteristics and also the operating parameters of the process. This article compares the yield and characteristics of coke obtained from FCC, tar and coal pitch at various temperatures and residence time.

Three experiments were conducted using each feedstock (FCC, tar, coal pitch) for a period of 5 hours for each. To find out the effect of residence time on the coking three sets of experiments for each feedstock were performed by first heating the samples for 4 hours to the set temperature and maintaining this temperature for another 5 hours (9 hours in total). Below is a table showing the results.

Table 1. 5 hours heating

HEATING FOR 5 HOURS			
TEMPERATURE (Degrees Celcius)	450	480	510
TAR			
Percentage of distillate (%)	61.458%	72.956%	75.919%
Percentage of Coke (%)	27.882%	17.357%	7.777%
FCC			
Percentage of distillate (%)	71.705%	88.567%	88.909%
Percentage of Coke (%)	20.681%	7.706%	6.55%
COAL PITCH			
Percentage of distillate (%)	46.4%	46,706%	43.856%
Percentage of coke (%)	43.7%	42.116%	43.556%