WEB OF SCIENTIST: INTERNATIONAL SCIENTIFIC RESEARCH JOURNAL
ISSN: 2776-0979, Volume 3, Issue 3, Mar., 2022

FRACTION OF NARROW PRODUCTS PRODUCED IN THE PROCESS OF OIL PROCESSING

Isakulova Mukaddas Shukurovna
Assistant, Jizzakh Polytechnic Institute,
Republic of Uzbekistan, Jizzakh city
i.mukaddas@mail.ru

Kodirov Orifjon Sharipovich
Candidate of Pharmaceutical Sciences, Docent,
National University of Uzbekistan, Tashkent city

Annotation
Today, the growing demand for hydrocarbons, as well as the global environmental crisis, are leading to an in-depth study of the possibilities of rational use of hydrocarbon energy sources. Currently, due to the fact that the environmental requirements for hydrocarbon fuels are much higher than the amount of aromatic hydrocarbons, it is impossible to mix the secondary products of some oil and gas refineries with commercial fuels. Therefore, single and multi-core aromatic hydrocarbons should be separated from the products and used for other purposes.

Keywords: condensate, pyrocondensate, pyrolysis, distillate, tar product, fluorene, anthracene, phenanthrene, fraction column thermostat.

Introduction

Particular attention is paid to the development strategy of the Republic of Uzbekistan, aimed at integrated use of natural resources and industrial waste, the development of new types of products and technologies, the deep processing and coordination of local raw materials for the production of finished products.

One of such secondary products is a by-product of JV LLC "Uz-Kor Gas Shemical" obtained by pyrolysis of ethane, propane-butane and gas condensate fractions of natural gas.

Pyrocondensate pyrolysis products make up 2% to 25% by mass, depending on the raw material. Pyrocondensate, in turn, is divided into three parts: pyrolysis distillate up to 180°C, pyrolysis oil up to 260 - 280°C and above 280°C narrow product residual fractions [1]. In this study, we studied the chemical composition of the processed products from the raw material of the tar product.

Tar product is a dark brown, brittle material that melts at 60 - 70°C, glassy solid, bleeds at a temperature of 270 - 280°C. JV LLC Uz-Kor Gas Shemical produces about 10,000 tons of tar products per year [2].

The tar product dissolves well in aromatic and chlorinated organic solvents. The main components of tar products are bi-, tri- and polycyclic aromatic hydrocarbons (60-85%), resins and asphaltenes (10-15%) [3]. Currently, tar is widely used as a raw material for the production of dry and technical carbon, due to the high content of aromatic hydrocarbons in the product [4-6].

In the process of developing the method of processing tar products, it is necessary to take into account some factors: the chemical composition of the light fraction of the tar product (evaporating fraction up to 350°C), sulfur content, cubic residue content and amount, anthracene and phenanthrene and their homologues.

EXPERIMENTAL SECTION

The narrow product was initially separated into fractions on a vacuum drive. When the tar product is heated, it liquefies at a temperature of 60-70°C and the initial fraction is released at a temperature of 270-280°C.

According to the results of scientific and practical research on the composition of pyrolysis products, the content of single and multi-nuclear armature hydrocarbons is two to three times higher than that of other hydrocarbons. The fractionation results are given in Table 1.

Table 1. Fractional composition of the secondary product of the tar product.

№	Fractions	T the beginning,°C	T finish,°C	Volume, %
1.	Fraction 1	245	300	27,2
2.	Fraction 2	300	360	37,6
3.	Cube residue	≥500	-	34,7
4.	Losses	-	-	0,5

The obtained fractions were first analyzed on a gas chromatograph with a mass-selective detector Agilent 5977A, prepared for qualitative and quantitative analysis of the original composition. “Agilent Technology” GC 6890 / MS 5973N chromato-mass spectrometer 30m × 0.25 mm 5% phenylmethylsiloxane in a capillary column of dimethylsiloxane, gas carrier - hydrogen, injector temperature - 280°C, MS source temperature - 230°C, MS quadrupole temperature - 180°C, the column thermostat was programmed from 100°C to 280°C, the temperature rise rate was 10°C minutes, the sample volume was 1 µl., the flow was carried out in split mode.

In order to qualitatively and quantitatively determine the composition of the cubic residue, the IR-Fure spectrometer was tested on a Nicolet 6700 Continuum and Raman-module microscopic analyzer [7,8].

According to the results of the analysis, cubic residual rubber is recommended as a plasticizer that can be used in the processing of various plastics of black color. Comparative data on the properties of plasticizers used in industry are given in Table2.

Table 2. Properties of plasticizers are comparative data

	The most alternative value	Viplex-885	Viplex-895	Cube residue
Aromatic compounds,%	≥90	95,5	98,0	96,7
Aniline point, °C	≤80	74-76	75-76	74-76
Flash point, °C	350-400	365	390	375
Boiling point, °C	≥500	≥640	≥500	≥500

Conclusion

It was shown by fractionation and various modern analyzes that at “Uz-Kor Gas Shemical” JV LLC it is possible to process one of the secondary products of pyrocondensate fractions formed during the pyrolysis of hydrocarbons - tar product.

The fact that the first fraction is a mixture of aromatic hydrocarbons C_{8-10} was comparatively analyzed by GCMS mass-detector gas chromatography, and this fraction was recommended for use as a special solvent for the production of autoclave-paint products. The composition of the second fraction is mainly a mixture of fluorene, phenanthrene and anthracene and their homologues.

Recommendations were made for the synthesis of dyes from these products in the future. The third cubic residue was studied by IR spectroscopic method, and it was proved and recommended that the residue could be fully used instead of imported plasticizers used mainly in the production of rubber, plastic products.

References

1. Исследование химического состава пироконденсата пиролизного производств., Кодиров О.Ш., Мирзакулов Х.Ч., Бердиев Х.У., Шарипова В.В., ТЕХНИЧЕСКИЕ НАУКИ., UNIVERSUM:, № 9 (54), сентябрь 2018 г.
2. Официальный сайт СП ООО ”Uz-Kor Gas Chemical” http://www.uz-kor.com/index.php/ru/deyatelnost 2018 г.

3. Лебедова И.П., Лазерев Д.Г., Дошлов О.И., Лубинский М.И., Лебедова Н.П. // В мире научных открытий. 2009. №5. С. 25 – 29.
4. Беренц А.Д., Меныциков В.А. // Хим пром-сть 1993. №5. С. 19-23.
5. Мухина Т.Н., Лесохина Г.Ф., Колесникова Т.А., Цеханович М.С. Состав и переработка тяжелых смол пиролиза: тематический обзор. М.: ЦНИИТЭ нефтехим, 1979. 77 с.
6. Цеханович М.С. Нефтепереработка и нефтехимия. М.:ЦНИИТ Энефтехим, 1974. 56 с.
7. Квантохимические методы исследования наноразмерных кластеров., Мукаддас Шукуровна Исакулова., Ойбек Санақул ўғли Суярқулов., Science and Education,2021г,том 2,№1.
8. Modeling of carbon nanotubes by molecular dynamics methods. Mukaddas Shukurovna Isakulova, Jahongir Ravshan Ogli Mamatqulov, Asadbek Abloqul Ogli Zikriyev. Scientific progress, 2021г, том 1.