ACTIVATED CHARCOAL FROM APRIL SEED SHELLS FOR ADSORPTION CLEANING OF STRAIGHT-RUN KEROSENE FRACTION.

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Abstract. Background of the problem. Based on the conclusion of the results of laboratory tests of the new improved AU-KU coal, for the purpose of import substitution, Bukhara Oil Refinery LLC refers to the pilot industrial use of these coals in the purification of direct kerosene

Keywords: adsorbents, demercaptanization, foaming, foaming agents, methyldiethanolamine, filtration, mulberry

Аннотация. Предыстория проблемы. Основываясь на заключении по результатам лабораторных испытаний нового улучшенного угля AU-KU, с целью импортозамещения ООО "Бухарский нефтеперерабатывающий завод" рассматривает возможность опытно-промышленного использования этих углей для прямой очистки керосина

Ключевые слова: адсорбенты, демеркаптанизация, вспенивание, пенообразователи, метилдиэтаноламин, фильтрация, шелковица

Annotatsiya. Yangi takomillashtirilgan AU-KU markali ko‘mir laboratoriya sinovlari natijalariga asoslangan holda, import o‘rnini bosuvchi mahsulot sifatida, “Buxoro neftni qayta ishlash zavodi” MChJ mazkur ko‘mirlarni to‘g‘ridan-to‘g‘ri kerosin fraksiyasini tozalash jarayonida tajriba-sanoat darajasida qo‘llashni maqsadga muvofiq deb topdi.

Kalit so‘zlar: adsorbentlar, demersaptanizatsiya, ko‘piklanish, ko‘pik hosil qiluvchi moddalar, metildietanolamin, filtrlash, tut daraxti

Introduction

Objective. U-CUs were improved by comparing the properties and characteristics of purified kerosene using ACTICARBONE BGP MX 10x30 activated carbon.

Method. For testing, 200 g of bentonite, 200 g of activated carbon AU-KU, 100 g of quartz sand, which were previously dehydrated in a drying oven, and 1 liter of straight-run kerosene sample were taken. Straight-run kerosene was passed through layers of bentonite, activated carbon and quartz sand. Then a purified

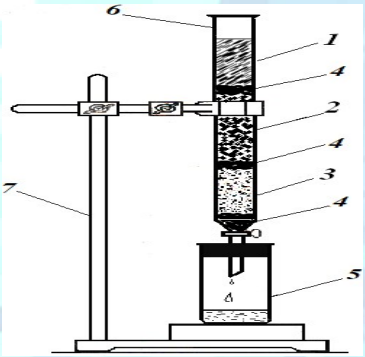
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sample of straight-run kerosene was collected into the receiver at a rate of one drop per second.

Scientific novelty. In order to replace the foreign activated carbon ACTICARBONE BGP MX 10x30 with a domestic sorbent used for purifying the straight-run kerosene fraction, a laboratory test of a new activated carbon from apricot seed shells (AU-KU) was carried out at the 12-unit BNPP for purifying the straight-run kerosene fraction.

Received data. The figure shows the adsorption isotherm of benzene on activated carbon AU-KU. From the adsorption isotherm of benzene on AU-KU coal, one can find out that at a low relative pressure P/Ps = 0.2, a sharp increase in the isotherm is observed, which means a large amount of benzene sorption.

Conclusion. At the Central Plant Laboratory, under the leadership of the head of the laboratory, an analysis was carried out to determine the physicochemical properties and technical characteristics of the resulting sample of purified kerosene. The results obtained are presented in the table, where they are compared with the characteristics of purified kerosene using ACTICARBONE BGP MX 10x30 activated carbon.



According to Bukhara Oil Refinery LLC, in 2021, in order to meet the needs in the process of kerosene demercaptanization, 5400 kg (30 m3) of activated carbon of the ACTICARBONE BGP MX 10x30 brand from Chemviron (France) was imported, costing 2140 US dollars per 1 m3 (180 kg). A total of 64,200 US dollars were spent on imports. It is important to consider that the country has a sufficient raw material base for the production of activated carbon of this type.In order to replace the foreign activated carbon ACTICARBONE BGP MX 10x30 with a domestic sorbent used for purifying the straight-run kerosene fraction, a laboratory test of a new activated carbon from apricot seed shells (AU-KU) was carried out at the 12-unit BNPP for purifying the straight-run kerosene fraction.A laboratory installation for the adsorption purification of straight-run kerosene has been assembled, which is shown in the figure.

Drawing. Laboratory installation for purification of straight-run kerosene.

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– bentonite layer, 2 – layer of activated carbon AU-KU, 3 – layer of quartz sand, 4 – thermal glass wool, 5 – receiver, 6 – glass column, 7 – tripod.

For testing, 200 g of bentonite, 200 g of activated carbon AU-KU, 100 g of quartz sand, which were previously dehydrated in a drying oven, and 1 liter of straight-run kerosene sample were taken. Straight-run kerosene was passed through layers of bentonite, activated carbon and quartz sand. Then a purified sample of straight-run kerosene was collected into the receiver at a rate of one drop per second.

At the Central Plant Laboratory, under the leadership of the head of the laboratory, an analysis was carried out to determine the physicochemical properties and technical characteristics of the resulting sample of purified kerosene. The results obtained are presented in the table, where they are compared with the characteristics of purified kerosene using ACTICARBONE BGP MX 10x30 activated carbon.

Table 1

Structural and sorption characteristics of activated carbon AU-KU and other industrial samples

Образец	Micropore volume $W_0 \cdot 10^{-3}$, m^3/kg	Mesopore volume , $W_{me} \cdot 10^{-3}$, m^3/kg	Total adsorption volume, $V_s \cdot 10^{-3}$, m^3/kg
АУ-КУ	0,262	0,029	0,291
БАУ	0,128	0,031	0,159
ОУ-А (модифиц.)	0,390	0,140	0,530
ФАС (рекопласт)	0,210	0,05	0,215

Table 2

Comparative physical and chemical properties and technical characteristics purified kerosene using activated carbons ACTICARBONE BGP MX 10x30 and AU-KU

№	The name of indicators	Actual value	
		Kerosene refined with ACTICARBONE BGP MX 10x30	Kerosene purified using AU-KU
1.	Total acid number, mg KOH/g	0,7	0,00056
2.	Volume fraction of aromatic hydrocarbons %	22	20,4

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3.	Kinematic viscosity at a temperature of minus 200C, mm2/s	не менее 1,25	3,055
4.	Mass fraction of mercaptan sulfur, %	0,003	0,00009
5.	Corrosion of copper plate 1000C	1	1a
6.	Mass fraction of total sulfur %	0,05	0,04
7.	Fractional composition: boiling point 10 % distillation at a temperature of 0C 50% distillation at 0C 90 % distillation at a temperature of 0C end boiling point, ^{0}C remainder from acceleration, % acceleration losses %	 no more150 no more 165 no more 195 no more 230 no more 250 1,3 0,7	 153 162 186 214 237 1,4 0,6
8.	Flash point in a closed crucible, 0C	not less38	44
9.	Density at temperature 150C, kg/m3	not less 775	792,2
10.	Freezing temperature, 0C	minus 47	minus 58

As can be seen from the data in the table, the physicochemical properties and technical characteristics of purified kerosene using AU-KU activated carbon were improved compared to the properties and characteristics of purified kerosene using ACTICARBONE BGP MX 10x30 activated carbon. Based on the positive results of laboratory tests of the new activated carbon AU-KU, for the purpose of import substitution, Bukhara Oil Refinery LLC recommended pilot testing of this coal for the purification of straight-run kerosene

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