DETERMINATION OF THE ADOPTION CHARACTERISTISCS OF ACTIVATED CARBON ON THE BASIS OF NUT SEEDS

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ABSTRACT
The article presents the results of a study to determine the physicochemical adsorption properties and some technological parameters for producing activated carbons based on bones. During the study, the physicochemical and adsorption characteristics of the new activated carbon from walnut seeds obtained by us were determined. For the purpose of import substitution, its characteristics were compared with the well-known industrial activated carbon brand AG-3

KEYWORDS: AG-3, activated carbon, walnut seed, adsorption activity,

INTRODUCTION
So far, activated coal has been imported to Uzbekistan. Activated carbon is used in the process of separation of metals from hydrometallurgical solutions, including in the purification of surkov oils and fuels from sulfur compounds,

It is used in the purification of aviation kerosene from mercaptan, in the purification of water from various heavy salts, as a filter in protovagas, and in this regard it is widely used in the pharmaceutical industry. Experimental tests were carried out on the separation of metals from hydrometallurgical solutions of activated carbon obtained from the bark of the seeds of fruit trees. The results of the study were compared with the properties of activated carbon of known AG-3. [7, 8] We have briefly named the charcoal obtained from the seeds of fruit trees AU-KO, and its properties have been studied according to the requirements of Tsh.

MATERIALS AND METHODS
The absorption capacity of AU-KO is determined using the cryoscopic method [9.10]. The selectivity and dynamic capacity of adsorbents by cryoscopic method are determined by changing the concentration of the chromatographic solution determined by the adsorbent and the crystallization of the solution as the temperature decreases.

The analysis is carried out as follows: 2% organic standard solution is passed from the glass column to 10 saturated cyclohexane adsorbent (fr. 0.25-0.50 mm, pre-dehydrated), ie the crystallization temperature of the filtrate (t3) is equal to the crystallization temperature of the original standard solution. up to (t2). Filtration rate is 1 drop per second, ie 0.4 volumes per hour. The crystallization temperature of the initial cyclohexane (t1) and the reference solution (t2) is pre-measured. Then the crystallization temperature of the filtrate (t3) is determined. The filtrate is taken from a portion of 12.85 ml (equivalent to 10 g). The crystallization temperature (t3) is determined in each batch, the amount of adsorbed substance (mol.%) Is determined by the following formula:

The molar percentage of adsorbed substance is calculated by the following formula:

Gde M is the molecular weight of the substance;

Molecular weight of 84.16-cyclohexane.

The amount of adsorbed substance is calculated in grams for each portion and then equalized to 100 g of adsorbent. This method is fast and accurate. This method is intended to use cyclohexane as a high-purity solvent to prepare a solution of model sorbents [7].

Activated charcoal is obtained by burning the peel of fruit seeds at 400-5000S. Different heated, take the same mass of the product, that is, the amount of product obtained at a temperature of 1000 g each. Table 1.

Roasted raw material is soaked in a solution of 4% Zncl2 for 20 hours. After saturation with Zncl2, 15% water is dried and activated with water vapor at 800-8500S. The product is granulated according to the requirements for use. the results are presented in Tables 1 and 2.

Table 1
Conditions of coal extraction process and its properties

Temperature °C	Weight after burning g	hardness, g / dm3	Surface area, m2 g	rate %	Benzene absorption, г/100 г
400	613	524	211	4,8	0,24
500	521	557	225	5,0	0,46
600	405	562	234	5,1	0,52
700	276	596	475	5,2	0,87
800	253	623	513	5,5	1,18

Table 2
The adsorption properties of activated carbon obtained from grains

Temperature, °C	Baking time.	Burning rate, %	hardness, g / dm3	Surface area, m2 / g	rate	Benzene absorption,г/100 г
800	60	29	577	805	9,5	1,45
850	120	27	570	890	8,5	1,87

According to the results of the experiment shown in Table 2, the absorption of benzene increased by 1.85 g when activated charcoal from the peel of fruit kernels was activated at 450-5500C in an airless place at an average temperature of 8500C for 2 hours with steam gas. In this regard, the expansion of bribes has also been identified. As can be seen from the table, the level of slavery has decreased with the increase in bribery, and we know in advance that the increase in bribery will increase.

Some properties of activated charcoal AU-KO obtained from the husk of fruit seeds were compared with the well-known AG-3 activated charcoal. Table 3

Table 3.
Comparison of properties of activated carbon AG-3.
results

Name of indicators	Activated carbon	
	АГ-3	АУ-КО
Hardness, g / dm3	450	512
The volume of the pores, cm3 / g	0,8-1,0	0,87-1,03
Micropore size, cm3 / g	0,24-0,28	0,30-0,35
Adsorption activity on C6H6, g / 100 g	1,23	1,87
Iodine uptake,%	43	75
, Hardness%	75	75-78
kul, %	14-16	4-5
Surface area, m2 / g	1016,8	1025,8

Table 3 shows the results of comparing the main properties of AU-KO activated carbon with AG-3 activated carbon. According to the results obtained, the absorption of the newly synthesized FC, the amount of sol in it and the porosity of the volumetric surface increase in volume and relative density.

The effect of purifying the prepared coal from toxic components to reuse the MDEA used in the production of AU-KO was studied. in the purification example, it was found that the concentration increased from 40% to 52% when the monoethanolamine solution was purified with AU-KO activated charcoal, and the carbon index was slightly reduced when purified with AG-3 activated charcoal.

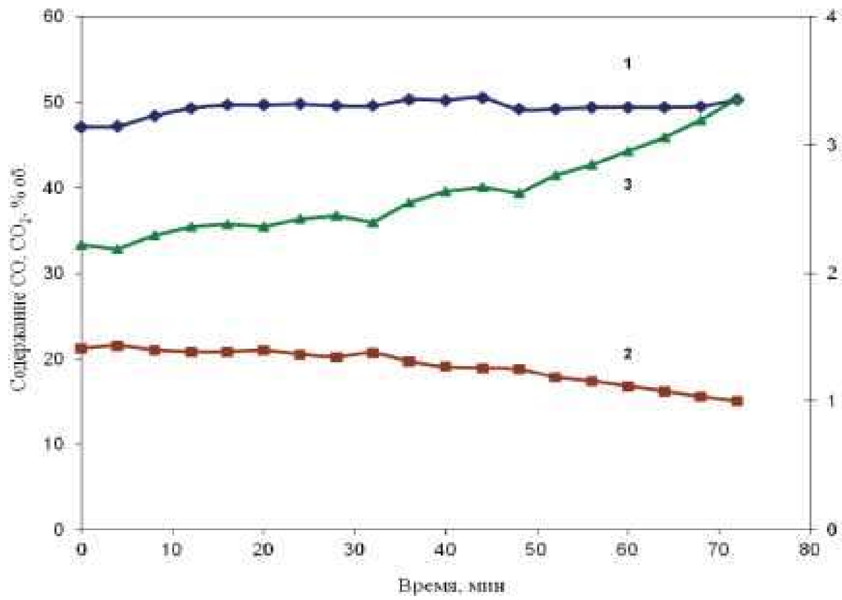


Figure 1.
Changes in the content of SO and SO2 in saturated MDEA over time.

When cleaning activated charcoal using MDEA at 8500S, it was found that 200g of AU-KO activated charcoal purified 8-9 liters of MDEA in a 70-minute time interval with saturation relative to the absorption time of SO and SO2. was made.

The amount of thermostable salts in the purified MDEA solution was 2.80% by mass. It is more than 1% of the permissible concentration, in the purified solutions of AG-3 and AU-KO coals their concentration is 0.83 and 0.81, not exceeding the permissible concentration.

The mechanical content of the first impurities of unrefined amines is high - 1068 mg / l, the permissible concentration is set at 500 mg / l, 488 mg / l for purification of AG-3 coal, and 479 mg / l for purification of AU-KO coals. so it seems to work better than AG-3 coal. The abundance of mechanical impurities leads to the formation of foam and foaming during processing.

Table 4
Physicochemical properties of MDEA purified with AU-KO activated carbon.

№	Properties	Example of MDEA used	AG-3 purified with activated carbon	AU-KO purified with activated carbon
1	Aminni konts,% mass	40	39	52
2	pH	10,80	10,40	10,40
3	Density, g / cm3	1,092	1,085	1,122
4	Amount of salts%	2,80	0,83	0,81
5	Amount of mechanical compounds, mg / l	1068	488	479
6	foaming: foam height, mm foaming time, sec	16 20	16 8	15 8

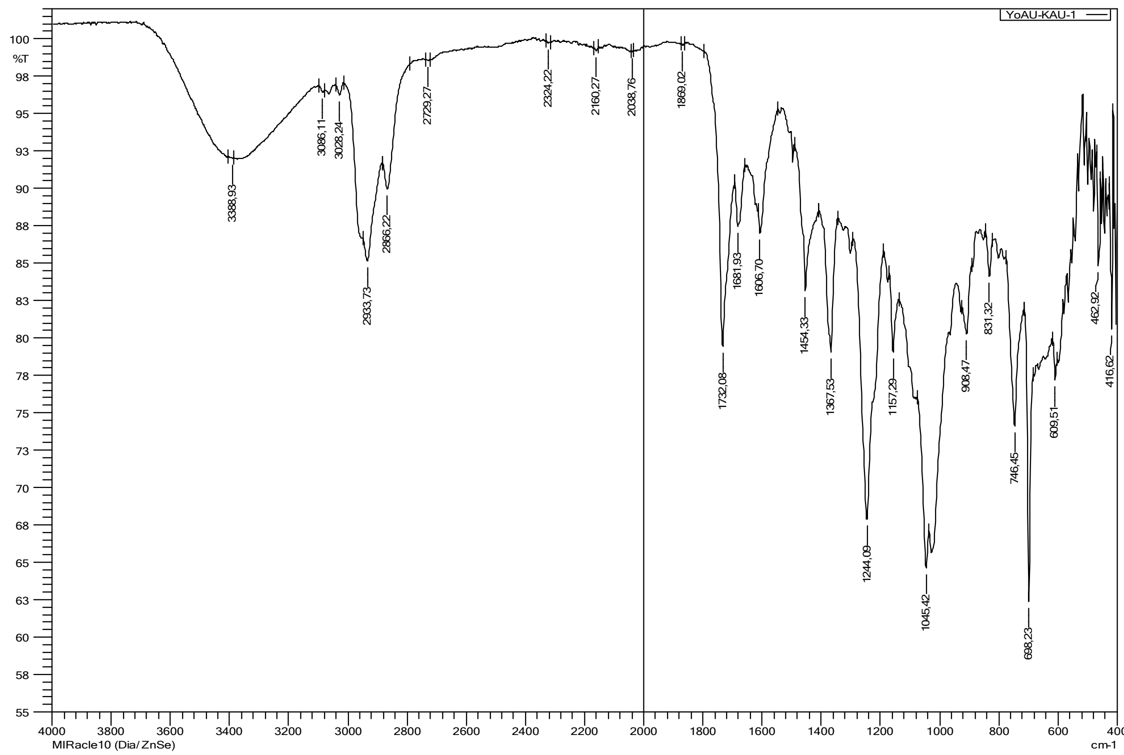


Figure 2.
IR spectral analysis of fruit seeds.

Figure 3 shows the element composition and internal structure of AU-KO activated carbon adsorbents obtained by pyrolysis of fruit peel using an electron microscope. Based on electron microscopic images of charcoal samples taken on the basis of fruit peel, the element composition is almost unchanged, only the presence of functional groups such as -ON, -SNO, -SOON on the surface of the charcoal sample taken at 850oS.

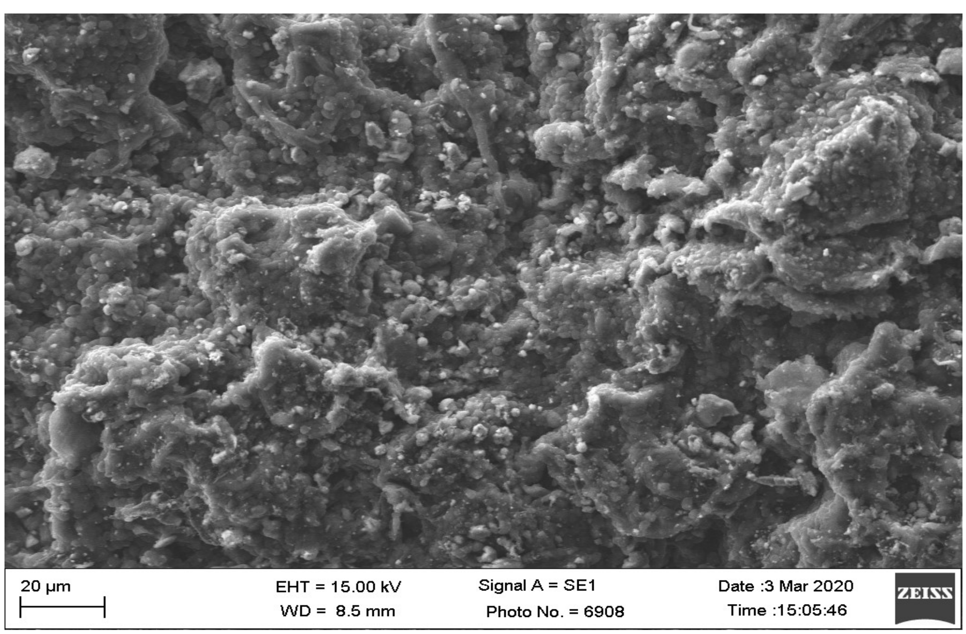
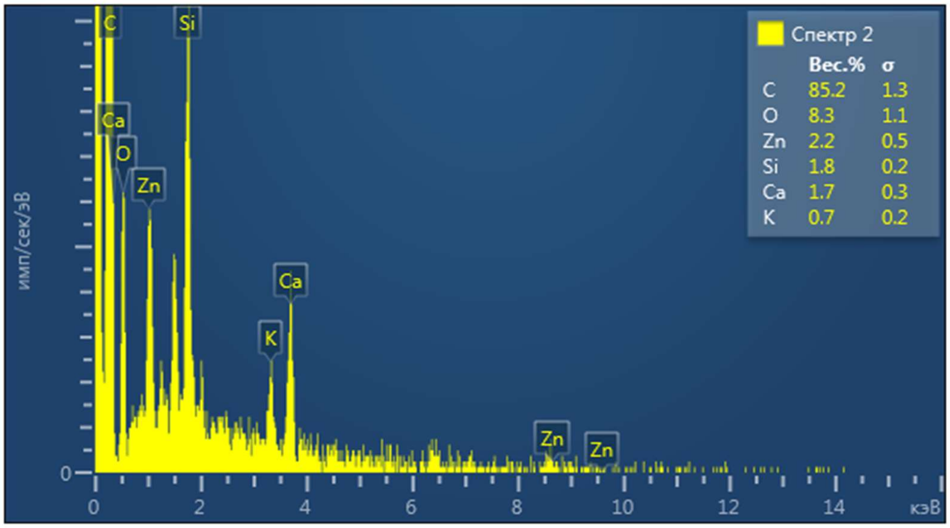


Figure 3.
Microscopic appearance of charcoal obtained from fruit seeds



picture 4.
Elements in coal

Table 5.
The amount of elements in coal.

Элемент	Вес. %	Сигма Вес. %
C	85.19	1.26
O	8.27	1.11
Si	1.84	0.23
K	0.74	0.20
Ca	1.75	0.26
Zn	2.21	0.46
amount	100.00	

CONCLUSION

Analyzing the data presented in the scientific literature, the absorbency of activated obtained AU-KO charcoal in MDEA was studied and AU-KO adsorbent was one of the highest quality adsorbents, which is much higher than other adsorbents (Table 3). It was concluded that it can be used in the absorption of metals in the field, in the purification of water.

REFERENCES:

1) Бутырин Г.М. Высокопористые углеродные материалы. – М.: Химия, 1976. – С. 187.
2) ГОСТ 12596-67. Угли активные: Метод определения массовой доли золы. – М.: ИПК Изд-во стандартов, 2003. – 4 с.
3) ГОСТ 17219-71. Угли активные: Метод определения суммарного объема пор по воде. – М., 1988. – 4 с.
4) ГОСТ 6217-74. Уголь активный древесный дробленый: Технические условия. – М.: ИПК Изд-во стандартов, 2003. – 8 с.
5) ГОСТ 16188-70. Сорбенты: Метод определения прочности при истирании. – М., 1970. – 5 с.
6) ГОСТ 16189-70. Сорбенты: Метод сокращения и усреднения проб. – М., 1970. – 4 с.
7) Кельцев Н.В. Основы адсорбционной техники. – М.: Химия, 1984. – 115 с.
8) Кинле Х., Бадер Э. Активные угли и их промышленное применение / пер. с нем. – Л.: Химия, 1984. – С. 215.
9) Рябова Н.Д. Адсорбенты для светлых нефтепродуктов. – Ташкент: ФАН, 1975. –144 с.