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DEVELOPMENT OF ADSORBENTS FOR RESERVOIR WATER TREATMENT

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Abstract. This article scientifically substantiates the technology for obtaining adsorbents used in the process of purifying formation waters produced in oil and gas fields. The physicochemical composition of formation waters was analyzed, and the importance of the adsorption process in reducing oil products, heavy metal ions, mechanical impurities, and dissolved salts in them was demonstrated. The thermal and chemical stages of obtaining adsorbents were analyzed, and their effectiveness was experimentally evaluated. activated carbon adsorbents used on the scale of the oil and gas industry, porous structure as a result of the process of activation by carbonization and oxidizing gases, the structure and properties of activated carbon biochemical composition depends on the nature of the precursor, which determines the dynamics, productivity, friction and ash content of the pyrolysis process.

Keywords: Layer water, activated carbons, oxidizing gases, cellulose biopolymers, synthesis, inorganic compounds, biomass, pyrolysis, biochemical properties.

Аннотация. В статье научно обоснована технология получения адсорбентов, применяемых в процессе очистки пластовых вод, образующихся на нефтегазовых месторождениях. Проанализирован физико-химический состав пластовых вод и показано значение процесса адсорбции в снижении содержания в них нефтепродуктов, ионов тяжелых металлов, механических примесей и растворенных солей. Были проанализированы термические и химические стадии получения адсорбентов, а их эффективность оценивалась экспериментально. применяемые в нефтегазовой промышленности адсорбенты с активированным углем в результате процесса карбонизации и активации окислительными газами имеют пористую структуру, структура и свойства активированного угля зависят от природы предшественника,

ISSN 3030-3907

биохимический состав которого определяет динамику процесса пиролиза, производительность, трение и зольность.

Ключевые слова: сточные воды, активированные угли, окислительные газы, целлюлозные биополимеры, синтез, неорганические соединения, биомасса, пиролиз, биохимические свойства

Annotasiya: Ushbu maqolada neft va gaz konlarida hosil bo‘ladigan qatlam suvlarini tozalash jarayonida qo‘llaniladigan adsorbentlarni olish texnologiyasi ilmiy jihatdan asoslab berilgan. Qatlam suvlarining fizik-kimyoviy tarkibi tahlil qilinib, ulardagi neft mahsulotlari, og‘ir metall ionlari, mexanik aralashmalar va erigan tuzlarni kamaytirishda adsorbsiya jarayonining ahamiyati ko‘rsatib o‘tilgan. Adsorbentlarni olishning termik, kimyoviy bosqichlari tahlil qilinib, ularning samaradorligi tajriba asosida baholangan. neft va gaz sanoati miqyosida ishlatiladigan faollashtirilgan uglerodli adsorbentlardan foydalanilgan, karbonizatsiya va oksidlovchi gazlar yordamida faollashtirish jarayoni natijasida g‘ovakli tuzilma, faollashgan uglerodning tuzilishi va xossalari biokimyoviy tarkibi piroliz jarayonining dinamikasini, unumdorligini, ishqalanishini va kul miqdorini belgilaydigan prekursorning tabiatiga bog‘liq.

Kalit so`zlar: Qatlam suvlari, faollantirilgan uglerodlar, oksidlovchi gazlar, sellyuloza biopolimerlari, sintezi, noorganik birikmalar, biomassa, piroliz, biokimyoviy xossalar.

INTRODUCTION

Protection of water resources from pollution and their rational use for the needs of the national economy are among the most important problems that require urgent solutions. Uzbekistan implements a wide range of environmental protection measures, in particular, on the rational use of water resources. One of the main areas of work on the protection of water resources is the introduction of new technological production processes, the transition to closed (drainless) cycles of water supply, where purified wastewater is not removed, but is repeatedly used in technological processes.

The current environmental situation and the state of environmental protection activities in the Republic of Uzbekistan contribute not only to the accelerated development and adoption of rational use of natural resources and effective environmental protection measures, but also to solving urgent scientific problems, in particular, hydrolysis and hydrolysis by growing algae, aquatic and marsh plants. This also requires the solution of appropriate biotechnologies for water purification in other industries. When processing raw materials in hydrolysis plants, a large amount of clean water is consumed. 500 m3 of wastewater is generated during the production of 1 liter of alcohol. The amount of wastewater discharged by a plant depends on its capacity. Thus, a medium-sized hydrolysis plant operating on wood waste discharges 6-7 thousand m3 of wastewater per day.

ISSN 3030-3907

Wastewater from the hydrolysis industry is polluted with organic and suspended solids compared to other wastewater. In this regard, the protection of reservoirs from wastewater pollution from the hydrolysis industry is of great economic and social importance. It is known that mechanical, physical, chemical and biological methods are used for wastewater treatment.

At the same time, biological reservoirs are used, the quality and nature of wastewater of which affect growth and development, as well as the composition of aquatic organisms and, ultimately, the intensity of wastewater treatment. Formation, composition and properties of wastewater. Depending on the conditions of formation, wastewater is divided into domestic, fecal, atmospheric and industrial. It also affects the composition of aquatic organisms and, ultimately, the intensity of wastewater treatment. Formation, composition and properties of wastewater. Depending on the conditions of formation, wastewater is divided into domestic, fecal, atmospheric and industrial. mixtures consisting of approximately 58% organic and 42% mineral substances are formed in these waters. Atmospheric wastewater is water that is formed as a result of melting rain and snow and drains from the territory of the enterprise. They are contaminated with organic and mineral additives. which are formed as a result of melting rain and snow and drain from the territory of the enterprise. They are contaminated with organic and mineral additives.

Domestic wastewater is water generated as a result of showering, washing, bathing, washing, mopping floors in dining rooms, toilets, etc. Mixtures consisting of approximately 58% organic and 42% mineral substances are formed in these waters. Atmospheric wastewater is water that is formed as a result of melting rain and snow and drains from the territory of the enterprise. They are contaminated with organic and mineral additives.

Industrial wastewater is generated during the processing and extraction of organic and inorganic raw materials. The sources that form wastewater in technological processes include:

1) waters formed as a result of chemical reactions (they are polluted by the starting materials and reaction products);
2) water in the form of free and bound moisture in raw materials and raw products, as well as moisture formed during processing;
3) water formed after washing of raw materials, products and water devices;
4) aqueous solutions;
5) Water extracts and absorbents;
6) heat carriers;

ISSN 3030-3907

7) other waste water; vacuum-waste water from pumps, mixing condensers, aerosol losses, washing dishes, appliances and buildings.

The amount and composition of wastewater depends on the type of production. It can be contaminated with various substances.: 1) biologically unstable organic compounds; 2) low-toxic inorganic salts; 3) petroleum products; 4) biogenic compounds; 5) specific toxic substances, including heavy metals, non-degradable organic synthetic compounds.

During the full technological cycle for the production of finished products, the water used is polluted by the initial, intermediate and final products. For example, wastewater from enterprises producing mineral fertilizers and inorganic substances with acids, alkalis, various salts (fluorides, sulfates, phosphates, phosphites, etc.), wastewater from enterprises of basic organic synthesis with fatty acids, aromatic compounds, alcohols, aldehydes; The waters of oil refineries - with petroleum products, oils, resins, phenols, SFM lar (surfactants); wastewater from enterprises producing artificial fibers, polymers, and various synthetic resins - will be contaminated with monomers, high-molecular substances, and polymer particles.wastewater from enterprises producing artificial fibers, polymers, and various synthetic resins will be contaminated with monomers, high-molecular substances, and polymer particles.

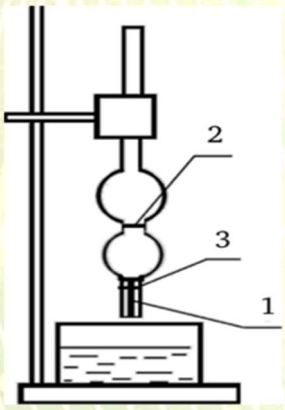


Figure 2.1. Stalagmometer. Hydrocarbon deposits g of activated carbon adsorbent is placed in a flask with a sample of reservoir water (0.5 - 1.5). It is shaken and stirred well and left alone for 20-30 minutes so that there is a balance in the solution. Then the layer in which the activated carbon is mixed is filtered through water, and the value of the solution that has reached the equilibrium state is determined by the method described above.

The degree of danger of wastewater depends on the nature and content of pollutants (toxicity) in them. Heavy metal salts, cyanides, phenols, hydrogen sulfide, carcinogens and other similar substances cause high toxicity of wastewater and a change in its odor.

ISSN 3030-3907

The amount of dissolved organic and inorganic substances, chemical oxygen demand and biochemical oxygen demand. The presence of impurities in the form of coarse, colloidal particles. I am on the following indicators:

1. Organoleptic parameters (color, taste, odor, transparency, turbidity of water, etc.).
2. Physico-chemical parameters (optical density, pH, temperature, electrical conductivity, alkalinity, acidity, hardness, fluidity, density, surface tension, etc.).
3. The amount of dissolved organic and inorganic substances, chemical oxygen demand and biochemical oxygen demand.
4. The presence of imp6urities in the form of coarse, colloidal particles.

Table-1

Elemental analysis of a water sample from the Northern Urtabulak m/r, exit from the CNS line

GdtcCjCP/	7Li	3Be 1	ⁿ 5	23Na	24Mg 27Al 31F	ЭЭК	44Ca	45Sc
The middle con-ration	24,31 mg/л	0,001 мз/л	171,52 мг/л	21 233,06 мг/л	1 151,60 мг/л	0,398 мз/л	1,38 мг/л	1 270,76 мг/л	7 044,63 мг/л	0,19 мг/л
Concentration	24,31 мз/л	0,001 мг/л	171,52 мз/л	21 233,06 мз/л	1 151,60 мг/л	0,398 мг/л	1,38 мз/л	1 270,76 мг/л	7 044,63 мг/л	0,19 мг/л
% CKO con-ration	m	нт	n/d	n/d	n/d	n/d	n/d	n/d		n/d
1 Category	51V	52Cr	55Mn	57Fe	59Cc	60Ni	63Си	66Zn	71 Ga	
The middle con-ration	0,113 мз/л	0,018 мз/л	0,085 мз/л	142,893 мз/л	0,008 мг/л	0,033 мз/л	0,055 мз/л	0,047 мг/л	0,008 мз/л	0,033 мг/л
Concentration	0,113 мз/л	0,018 мз/л	0,085 мг/л	142,893 мз/л	0,008 мг/л	0,033 мг/л	0,055 мг/л	0,047 мг/л	0,008 мг/л	0,033 мг/л
% CKO con-ration	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Category					n/d					
The middle con-ration	1,755 мз/л	0,311 мг/л	509,433 мг/л	0,754 мг/л	25.236 мг/л	0,001 мг/л	0,030 мг/л	0,414 мг/л	0,004 мг/л	0,004 мг/л
Concentration	1,755 мз/л	0,311 мг/л	509,433 мг/л	0,754 мг/л	25.236 мг/л	0,001 мг/л	0,030 мг/л	0,414 мг/л	0,004 мг/л	0,004 мг/л
% CKO con-ration	m n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
1 Category	141 Pr	146Nd	147Sm	153Еи	157Gd	159Тb	163Dy	165 Ho	166Er	169Тт
The middle con-ration	0,005 мз/л	0,002 мг/л	0,003 мг/л	0,005 мз/л	0,002 мг/л	0,003 мг/л	0,003 мг/л	0,005 мг/л	0,001 мг/л	0,002 мг/л
Concentration	0,005 мз/л	0,002 мз/л	0,003 мг/л	0,005 мг/л	0,002 мг/л	0,003 мг/л	0,003 мз/л	0,005 мг/л	0,001 мг/л	0,002 мз/л
% CKO con-ration	нт	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
	172Уb	1~5Lu185Re		205T!	208Pb 209Bi		232Th		233U
The middle con-ration	0,002 мз/л	0,003 мз/л	0,000 мг/л	0,000 мг/л	0,003 мг/л	0,001 мг/л	0,000 мг/л		0,002 мг/л
Concentration	0,002 мз/л	0,003 мг/л	0,000 мг/л	0,000 мг/л	0,003 мг/л	0,001 мг/л	0,000 мг/л		0,002 мг/л
% CKO con-ration	n/d	n/d	нт	m	Ж	н/Д	н/Д		m.

When wastewater is heated, inorganic substances can also volatilize. Therefore, the presence of organic substances is proved by determining the chemical oxygen demand (COD) and the biochemical oxygen demand (BOD).the presence of organic substances in wastewater. When wastewater is heated, inorganic substances can also volatilize. Therefore, the presence of organic substances is proved by determining the chemical oxygen demand (COD) and the biochemical oxygen demand (BOD).

KBKE is the amount of oxygen consumed in an acidic environment for an oxidizing agent — potassium permanganate (KMnO4) or potassium bichromate (K2Cr2O7) in an equivalent amount. KBBE is the amount of oxygen that is spent on aerobic biodegradation of organic compounds over a period of time, and is determined by permanganate or bichromate oxidation. In both methods, the amount of oxygen consumed should be equivalent to the amount of oxidant used, i.e. KMnO4 or K2Cr2O7.

There are a number of ways to reduce the amount of contaminated wastewater. These include: 1) Creation and application of waste-free technological

ISSN 3030-3907

processes; 2) improvement of existing processes; 3) Creation and application of modern devices; 4) application of air cooling devices; 5) application of treated wastewater in circulating and closed systems.

Currently, the most optimal methods of reservoir water purification in oil fields are being developed. It can be said that there are many types of purification, among which the most preferred is adsorption purification. Currently, the demand for adsorbents is growing every day. As a local sorbent, it differs from other sorbents by improved sorption properties.

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