ISSN NO: 2770-4491
Date of Publication:06-08-2022

Industrial Waste Water Treatment Methods

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Annotation: Protecting the environment from pollution and using natural resources wisely is one of the main problems of the modern era. Saving and protecting water resources is one of the solutions to this problem.

Keywords: freshwater, salt water, physicochemical cleaning method, adsorbing, coagulation, flocculation, flocculation, flotation, ion-exchange, extraction, chemical cleaning, neutralization, oxidation, refrining, biochemical cleaning, aerobic, anaerobic conditions, thermal cleaning.

Introduction: Water plays an important role in the basic processes that take place in nature, as well as in human life. In the industry, water is used as a source of raw materials and energy, coolant or heater, solvent, extragent, crude ashiyo and material carrier and for a number of other needs.

The total volume of natural water on the planet is 1386 million square miles [1,386 million sq km]. Of that, more than 97,5% are ocean, sea and lake waters.

Worldwide, the need for freshwater is 3,900 billion sq.m3 per year. Approximately half of the same indicator is not used and returned, and the other half becomes freshwater.

One of the solutions to this problem is the proper use of freshwater treatment facilities (method devices) for recycling freshwater or throwing it into water concerns.

Building water conservation facilities and increasing the power of the water reuse system protects water sources better from construction or pollution at all, using a poor water use system in enterprises and also establishing an automated system for managing water complexes, proper use of water resources in our country, protecting them from pollution through farming, industrial enterprise waste, and water purification process through good organization.

As the foregoing shows, to protect the environment and water worries, it is necessary to clean deep before dumping freshwater into basins. Additionally, production (industrial) freshwater is considered very toxic and is rich in chemical (reagent) elements. (Matthew 24:14; 28:19, 20) Therefore, manufacturing (industrial) enterprises are desirable if a closed system is used to recycle freshwater.

Natural water is water that is formed qualitatively and quantitatively as a result of natural processes without any anthropogenic impact.

Depending on the level of mineralization of water (at g/1)

pumpkin (total salt content <1),

sho‘rroq (1... 10),

sho‘r (10...50)

namakob (>50) long ajratiladi.

Freshwater, in turn, is divided into low mineral mixtures (up to 200 mg/1), moderate mineralized (200-500 mg/1) and high mineralized water. Depending on the amount of anions contained in it, the water becomes hydrocarbonate, sulphate and chloride.

The hardness of natural water is determined by the fact that they contain calcium and magnesium salts. The concentration of Ca2+, Mg2+ ions contained in the waters is expressed in mg-ekv/1. Water hardness is divided into common, carbonate and non-carbohydratic species Common hardness consists of a sum of carbonate and non-carbohydratic hardness.

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Carbonate hardness is associated with the presence of calcium and magnesium bicarbonates in water. And the hardness without carbonate depends on the amount of calcium and magnesium sulfates, chlorides and nitrates. 12 Under ODST 950:2000, the hardness of drinking water must be between 2.5 and 7 mg-ekv/1 in accordance with the requirements of "Drinking water, hygienic requirements and quality control." Even when the water hardness is 4 mg-ekv/1, large amounts of sediment are collected in water supply systems and electrical appliances. Solid water adversely affects the human body, industrial and household appliances. Therefore, water is softened to prevent devices from going out of business. In some countries, the hardness of the waters is classified differently (table):

Suvning qattiqligi, mg-eq/1	**Gidrokimyo bo'yicha ma'lumotnoma**	**Water preparation**	**Germany DIN 19643**	**USEPA**
0 -1 ,5	Yumshoq suv	Very soft water	Yumshoq suv	Yumshoq suv
0,5-1,6		Yumshoq suv		0 'average solid water
1,6-2,4			0 average solid water	
2 ,4 -3 ,0			Hard enough water	
3,0-3,6		0 'average solid water		Solid water
3,6 -4 ,0			Solid water	
4,0-6,0	0 'average solid water			
6,0—8,0		Solid water	Very hard water	Very hard water
8,0-9,0	Solid water			
9,0-12,0		Very hard water		
More than 12.0	Very hard water			

*Physical properties of water***.** The density of clean water is 15 degrees Fahrenheit [15°C] and 999 kg/m 3 at 760 atmospheric pressure. As the concentration of 13 mixtures in the water increases, its density also changes. The average density of seawater with a concentration of salts of 35 kg/m3 is 1028 kg/m3 at 0°C. If the amount of salts changes by 1 kg/m3, the density changes to 0.8 kg/m3. As the temperature rises, the water viscosity decreases by c

t, °c	0	5	10	15	20	25	30	35
µ, mPa-s	1,797	1,523	1,301	1,138	1,007	0,895	0,800	0,723

As the amount of salt in the water increases, the composition of the water also increases. Also, if the surface of the water is 73 m N/m at a temperature of 18 degrees Fahrenheit [-18°C], it will fall to 52.5 mN/m when the temperature is 100 degrees Fahrenheit [-100°C]. Temperatures range from 0°C to 4180 J (kg-°C), while at 35°C they show the lowest friendship. The melting temperature at the time of the ice's transition to a liquid state is 330 kJ/kg, and the heat generated by today is 2,250 kJ/kg at atmospheric pressure and temperatures of 100 degrees Fahrenheit [100°C].

*Electrical properties of water***.** Water is a weak electrical conductor. Its comparative electrical conductivity at 18°C is 4.41 • 10 h 1/Om-cm, and the dielectric constant is 80. Having salts dissolved in water increases its electrical conductivity. This properties of water will directly depend on temperature fluctuations.

*Optical properties of water***.** The accuracy and turbidity of the water depends on the amount of mechanical impureness in the state in which it is contained. If there is a lot of dirty additives in the water, its level of turbidity increases and its accuracy decreases. The accuracy is determined by the length of the light path entering the water being measured. From the water, ultraviolet light is easy, and infrared light passes hard. The indicator of accuracy can be used to determine the m capacity of dirty mixtures in water and to evaluate the quality of water

Cooling waters. Water is often used to cool liquid and gas-state products in heat exchange devices. In the industry, between 65 and 80% of water consumption is used to cool down. In large chemical companies, the need for cooling water is 440 million per year. in3.

Technological ***water is*** divided into environment-producing, washing and reactive waters. Environmentally producing waters are used in melting and generating pulp, enriching and processing ore, and

ISSN NO: 2770-4491
Date of Publication:06-08-2022

hydrotransporting industrial products and waste. Washing water will be needed in the gas state (absorption), liquid (extraction), and solid product washing. Reactive water is used in the composition of reagents, as well as in azeotropic driving and similar processes. Technological waters are directly affected by products and materials. The table below lists the requirements for water used for various purposes.

Ko'rsatkichlar	**Chemical Fiber Manufacturing Industry**	**Chemical industry**	**The unwed cellulose industry**	**Steam production** in **high-pressure boilers (5-10 MPa)**
Total hardness, ekv/m3 Amount of substances, g/m3: silicon dioxide	0,035 -	0,012 50	5 50	0,035 0,7
Put	-	-	-	0,05
marganes	0,03	-	-	-
iron	0,05	0,1	0,1	0,05
kislorod	-	-	-	0,3
nitrate nitrite	-	-	-	-
pH ko'rsatkichi	7 - 8	6,2 – 8,3	6 - 10	8 - 10
Ranglilik, grad	5	20	-	-
Oksidlanish, g/m3	4	-	-	-

Energy water is used to obtain steam, heat devices, buildings and products. The quality of water used in the technological process should be higher than the quality of the water in the circular water systems. Water quality refers to a collection of physical, chemical, biological, and bacteriological indicators that ensure that it can be used in an industrial enterprise. Sometimes it contains between 10 and 15 g/m 3, a density of more than 0.01 m ol-ekv/m 3, and oxidation of 2 g 0 2/m 3.

Depending on the conditions for the formation, composition, and properties of freshwater, they are divided into household, fecal, ntmosfcra, and industrial freshwater.

Main part:

Industrial freshwater treatment methods are re-purified as a result of the arrival of clean water in solar radiation and dirty water. Various bacteria, fungi and algae are active agents in water purification. If the water is oversaken with various impurities, then various independent or complex methods are used to clean it. To create a closed system of water supply, industrial freshwater is purified to the required quality of water depending on the type of enterprise through mechanical, chemical, physical, chemical, biological and thermal cleaning methods. In addition, the recorded methods are boTinadi to recuperation and destructive methods. The recuperation methods are aimed at isolating all the valuable substances in freshwater and then reusing them. In a destructive way, water is decomposed using oxidation or recovery methods from pollutants. Decomposition products are separated from the water in the form of gas or sediment. The selection of cleaning methods is carried out taking into account the following factors:

1) sanitary and technological requirements for cleaned water, taking into account reuse;

2) the amount of freshwater;

3) the amount of energy and material resources required for the deconstruction process in the enterprise (wheat, fuel, compressed air, electricity, reagent, sorbents), as well as the necessary area for cleaning facilities and facilities.

Water is taken up through the branches by a lightweight wood, had to be carved by two to inches [50 by 70 m] in diameter. The dirt is solid or liquid, forming a dispersing system. Depending on the particle size, dispersed systems are divided into three groups:

1) stagnant dispersion (suspensions and emulsions) systems with particle sizes above 0.1 cm;

2) zarracha o‘lchamlari 0,1 mkm; dan 1 nm gacha boigan kolloid sistemalar;

3) genuine solutions containing particles that match a separate molecule or ion dimensions.

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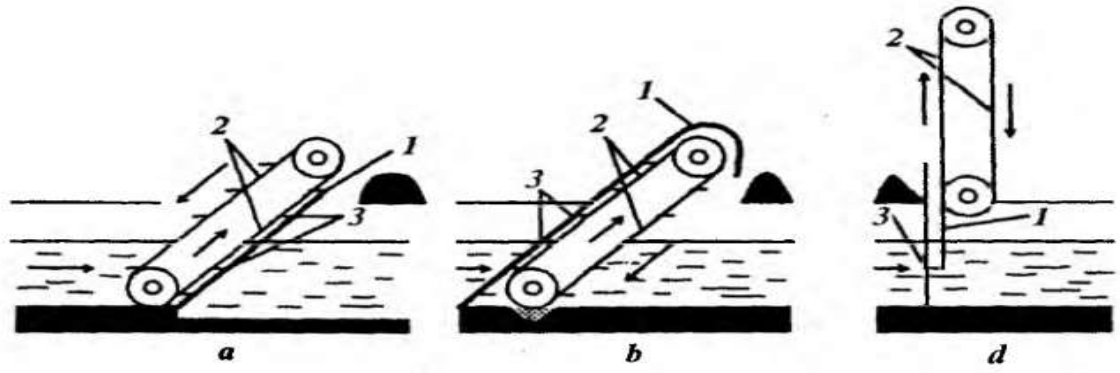
Chemical processes are used to separate physicochemical, organic, and anorganic solutions for hydromechanical processes, colloidal dispersion systems, to extract particles from freshwater content. Choosing these processes depends on particle size, physics and chemical properties, their concentration in water, and on the consumption of freshwater. Therefore, the following methods are used to clean freshwater:

1. Mexanik (suzish, tindirish, cho'ktirish, filtrlash, sentrifugalash va h.k.).
2. Physics and chemicals (adsorption, coagulating, flocculation, flotation, ion exchange, extraction, etc.).
3. Chemical (neutralization, oxidation, return).
4. Biokimyoviy (aerobic, anaerobic sharoitlarda).
5. Thermal (with high temperature participation).

These methods, in turn, are divided into various cleaning processes. When cleaning freshwater, it is primarily used by a mechanical method.

Mechanical cleaning of freshwater by mechanical method of cleaning freshwater is extracted from unsolved mineral and organic compounds containing freshwater. In mechanical cleaning of industrial freshwater, physics, chemical, biological and thermal methods are used to achieve a high level of water purification. Cleaning by exanic methods provides a reduction of 90+95% in the separation of freshwater content and from 20 to 25% in terms of organic pollution (to iiq KBBE). Water purification uses such processes as swimming, tincture, refinement, filtering, and centrifugation of 22 centrifuges with the help of bars of different sizes in diameter. The size of the water treatment facilities, their type, will depend primarily on the amount, composition and properties of freshwater, as well as on subsequent processing processes for water. To fully rinse freshwater, circular barbecue filters or microfilters and high-pressure filters, penopoliuretan or penoplastic floating filters are used. The resulting embryo was allowed to develop in nutrients and then inserted into her quiver. Choosing a method of cleaning freshwater from cylinder particles is carried out taking into account the process kinetics. The size of the particles in industrial freshwater can be divided into very large margins (the diameter of the particles is from 5+1 O'9 to 5+1 O'4 m). For particles of up to 0's size up to 10μm, the final precision rate is smaller than 10'2 cm/s. If the particles are large (between 30 and 50 inches [30 and 50 cm] in diameter or larger), then they are tinted (under the influence of gravitational forces) or floated according to Stokes Law. It should be noted that if the concentration of the aning in the water is abundant, it is tinted, and if the concentration is small, it is floated.

Swimming and refreening Swimming method is used to ensure that canals and pipes are not overcrowded, as well as to distinguish between large mixtures containing freshwater, before effectively cleaning industrial freshwater. When performing this process, grilles or shoulders are usually used. The grids are divided into types that are prone, non-arousing, as well as combined with grinders. The bars are made of metal tubes and installed at an angle of between 60 and 75 degrees Fahrenheit [-60 and 75°C]. Circular cross-sectional tubes have little resistance, but quickly pollute, so most often a straight-angle tube is used. The bars clean fresh water with the help of a variety of installed hoses.



2.1-rasm. **Oqova suvni tozalashda ishlatiladigan xaskashli panjara turlari (*a—d*).**
1— panjara; *2*— zanjir; *3*— xaskash.

The intermolecular force from all these filaments is enough to support more than the gec weight—when it is skittering upside down without a globe! With the help of bars, dirty mixtures are separated and sent

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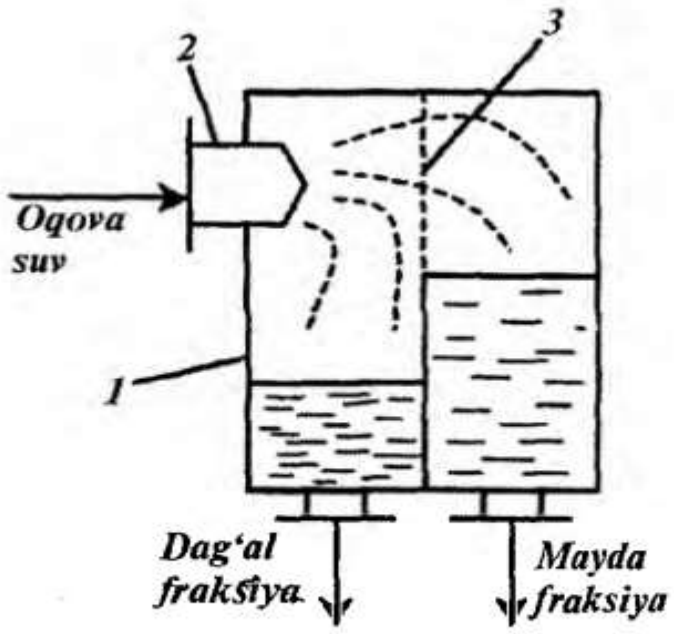
for processing. The resulting embryo was allowed to develop in nutrients and then insperated into her womb, where it implanted. The cost of energy consumed to do these things is 1,000 m 3,24 gallons [1,000 sq m] of water. In some constructions, grinders will be installed. The grate grinders consist of an aggregate that simultaneously acts as both a grinder and a grinder, which grinds waste without separating it from the water content. Water is taken up through the dead, with the highest dense jawbone of lime than the fertilized egg's implanting in the lining of the womb. The shoulders can be of 2 types: barbecue and discrete. The barbecue elbow cracks are between 0.5 and 1.0 mm in diameter and are in a circular shape. During the barbecue cycle, freshwater is filtered and cleaned from its inner or outer side. The filtration process depends on whether the water is given from the inside or from the roof of the external roof. The preserved mixtures are washed from the net using water and transferred to the tarpaulin. The operation of the grid barbecue shoulders depends on the diameter and length of the barbecue, as well as the nature of the dirty mixing. Such shoulders are often used in the textile, cellulose-paper and skin folding industries. It is desirable to divide them into fractions because of the different diameter of the particles that do not fall into the sink. For this, special fractionators are used. Fractions consist of a two-part camera and are separated by a wall made of circular metal that stands vertically in the middle. Circular dpvor holes are between 60 and 100 inches [60 and 100 cm] in diameter. Water is taken up through the tree's roots and roots and spreads by a silvery furnace. The intermolecular entity used by Jehovah's Witnesses in your country is a brochure entitled Charitable Planning to Benefit Kingdom Service Worldwide has been prepared.



2.2- rasm. **Fraksionator:**
1 — qobiq; *2* — soplo; *3* — ajratuvchi to'r.

The tincture method is used to soak up stagnating dispersion mixtures in freshwater. Precipitation is carried out under the influence of weight strength. For carrying out the procedure, sandblasters, refrigerators and refrigerators are used. Simultaneously, the refrigeration of freshwater in the refrigerators is also carried out. The physical properties of different shapes and sizes in freshwater particles change in the process of precision.

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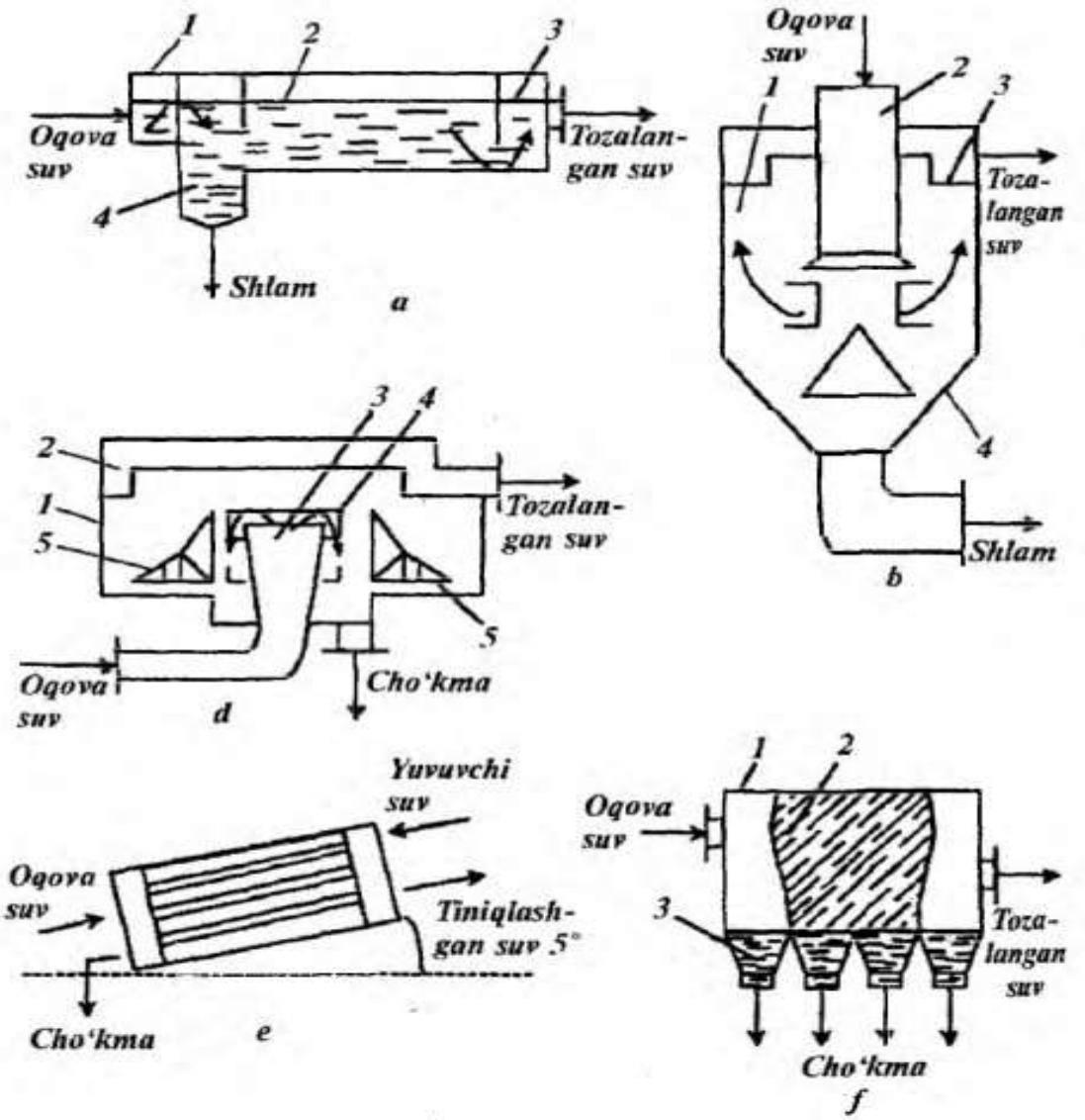

2.3-rasm. **Tindirgich turlari.**
a — gorizonal tindirgich: *1* — kirish tarnovi; *2* — tindiruvchi kamera; *3* — chiqaruvchi kamera; *4* — chuqurcha; *b* — vertikal tindirgich: *1* — silindrsimon qism; *2* — markaziy quvur; *3* — suvni qaytarish moslamasi; *4* — konussimon qism; *d* — radial tindirgich: *1* — qobiq; *2*— jelob; *3*— ajratuvchi moslama; *4* — tinchlantiruvchi kamera; *5* — sidirib beruvchi mexanizm; *e* — trubkasimon tindirgich; *f* — bukilgan plastinali tindirgich: *1* — qobiq; *2* — plastinalar; *3* — cho'kma qabul qiluvchi.

The filtration method is used to isolate small disperse solids or liquids in freshwater content. Because it is difficult to distinguish them by tinkering.

Physico-chemical cleaning of freshwaterincludes such methods as coagulation, flocculization, adsorption, ion-exchange, extraction, rectification, evaporation, distillation, recurrent osmos, ultrafiltration, crystallising, desorblash. These methods are used in cleaning of small dispersed particles (solid and liquid) containing freshwater, dissolved gases, minerals and organic matter. The use of physics methods has a number of advantages over biochemical methods: 1. It is possible to eliminate toxic biochemical non-oxidized organic pollutants containing freshwater. 2. Much deeper and more stable cleaning is achieved. 3. The devices are small. 4. The effectiveness of pressures changes is low. 5. Full automation is possible. 6. The kinetics of some are deeply studied, have the ability to model, mathematically explain, and optimize. 7. It is possible to recoup various substances. When cleaning freshwater, the method is selected in accordance with the requirements of

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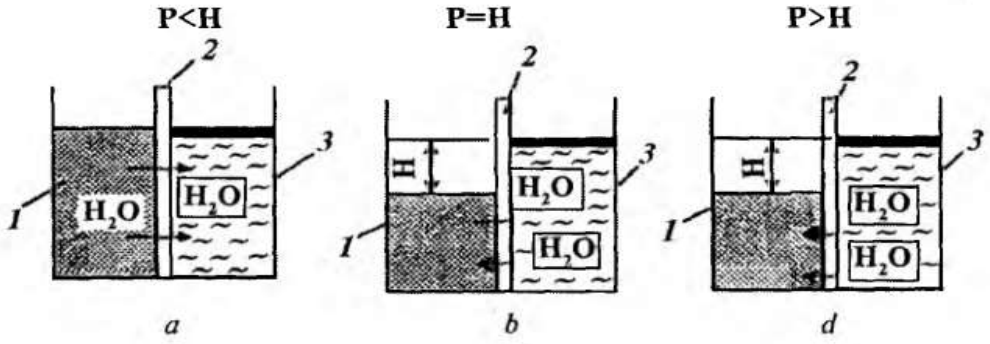
sanitation and technology. This takes into account the amount of freshwater, the concentration of pollutants, the availability of material and energy resources, and the usefulness of the process.

Flotation is used in a flotation method to isolate mixtures that do not dissolve from freshwater and sink independently on their own. Sometimes this process is also used when isolating dissolved substances, e.g. surfactants (SFM). This process is called condensation. Flotation is used in the treatment of freshwater from petroleum processing, artificial fiber, cellulose production, skin increase, mechanical engineering, food, and chemical engineering. This method is also used to isolate active turbidity after biochemical cleaning.

Examples of cleaning with the ion-exchange method . The extraction of metal ions depends on their water concentration, pH, total mineralization of water, the amount and concentration of calcium and iron ions. For the recuperation of metals, strong (H-form) and weak (Na-shaped) acidic cationites are used.

The process of filtration of melts through semiconductor membranes at high pressure from reverse osmosis and ultrafiltration Osmotic pressure is called reverse osmosis and ultrafiltration (Fig. 3.13). The membrane passes through the molecules that dissolve itself, while holding dissolved substances. In the opposite osmosis, particles that are not larger than the size of the solvent molecules are separated. In ultraflection, a separate particle size dz is usually larger. Below are the limits of the application of these processes. Process Reverse osmosis Ultrafiltrlash Macrophiltrlash dz, mkm 0.0001-0,001 0.001-0.02 0.02-10 This process differs from simple filtration with the separation of the fine-sized particle. The pressure needed to conduct the reverse osmosis process is much higher (6-10 MPa) than the pressure needed by the ultrafilting process (0.1-0.5 MPa). Reverse osmosis is used to desalinate water in heating power plants and in various industrial enterprises (semiconductors, kinescopes, pharmaceuticals, etc.) and to clean city freshwater. The simplest interface of the reverse osmos is composed of a high-pressure pump and a sequentially connected module (membrane element) (Fig. 3.14). Advantages of the method: the separation of pollution does not have to be divided into phases, low energy consumption, without chemical reagents or the possibility of carrying out at room temperature by adding a small amount of reagent; simplicity of the device structure. Deficiency of the method: the formation of concentration polarity caused by an increase in the concentration of substances dissolved in the outer surface of the membrane. This condition leads to a decrease in the working productivity of the device, a decrease in the breakdown phase of the components, and a decrease in the working time of the membrane.



3.13-rasm. **Osmos sxemasi (*H* — osmotik bosim, *P* — ishchi bosim).**
a — to‘g‘ri osmos; *b* — osmotik tenglik; *d* — teskari osmos;
1 — toza suv; *2* — membrana; *3* — eritma.

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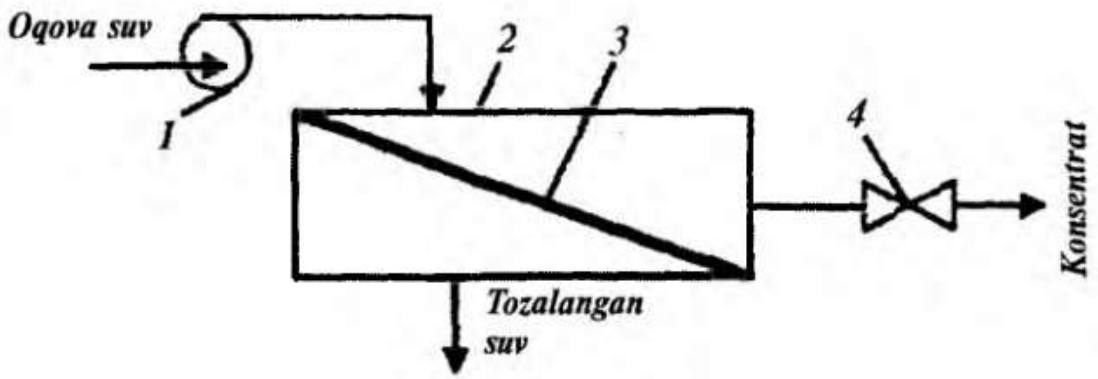

3.14-rasm. **Teskari osmos qurilmasining chizmasi.**
1 — yuqori bosimli nasos; *2* — teskari osmos moduli;
3 — membrana; *4* — chiqaruvchi klapan.

The effectiveness of the process depends on the properties of the membranes in use. They should have the following advantages: high separation characteristics (choice), high comparative productivity (conductivity), resistance to environmental influences, change in characteristics in the process of operation, have mechanical density, and low identification.

Conclusion: Given the development of industry in world friendship today, the increase in the number of people in the world, the global problems caused by climate change, and the lack of uniform scattering of industrialization and water reservoirs in the world, the deep recycling of not only industrial but also other types of freshwaters is considered very important. The transfer of irrigation systems to a drip mechanism should also be transferred to a closed, intensive cycle of maximum water circulation in other types of production processes.

And when cleaning industrial freshwater, it is desirable to choose methods of powdering the output from the abandonment of the wastewater.

Available publications:

1. Technology for cleaning freshwater – S.Turobjonov, T.Tursunov, X.Pulatov
2. Aquatic water discharge networks – E.S.Buriyev, K.F.Yakubov
3. Basics of industrial waste disposal technology – M.N.Musayev
4. Wikipediya ma'lumotlari