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Purification of Waste Water of Oil-And-Fat Production By Compositions of Reagent-Adsorbents

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ABSTRACT: This article shows the possibility of using reagent-adsorbent compositions, i.e. charred defecate obtained at 600 °C and activated bentonite of the Askamar deposit in a ratio of 1:5.

It was found that with the use of reagent-adsorbent compositions it will allow to purify wastewater from oil and fat production to pH-7.2 and transparency of 0.44, and also the water hardness is reduced from 17 mEq / l to 4.0 mEq / l, which allow the recycling of wastewater for technical needs.

KEYWORDS: purification, waste water, activation, defecate, oil, bentonite, composition, MPC, pH, transparency, hardness.

INTRODUCTION

The fat and oil industry produces various types of products for national production, where a large amount of wastewater is generated, which greatly pollutes the environment. Typically, wastewater from fat and oil enterprises is gray and contains a sufficient amount of suspended solids, sediments and turbidity, which is a fertile basis for rapid decomposition, accompanied by a characteristic putrefactive odor. Such effluents need to be purified in stages up to MPC standards in order to create the possibility of re-use as industrial waters.

When designing treatment facilities for such wastewater, it is important to take into account that mixtures with and without fatty impurities in their composition must be treated separately. The active reaction of the medium is pH 6.7, the content of fat is 256-396 mg / l. Fat is most often present in the form of vegetable oils, small amounts of which cover the water mirror, making it difficult for oxygen to re-aerate and dissolve. Passing through the sewer networks, these oils adhere to the channel walls, glue contaminants, which reduces the flow cross section. In addition, organic acids and nitrogen-containing substances are present in wastewater.

The presence of a large amount of organic compounds in the effluent, which quickly decompose, causes acidic fermentation, resulting in rotting. Wastewater from enterprises is discharged into various sewerage networks, depending on the characteristics of the effluent [1-5].

THE MAIN FINDINGS AND RESULTS

In most Western European countries, flotation with incineration of production wastes is used, in the USA, Germany, Italy - chemical reagent methods. In Italy, in the field of fat processing technology, a two-stage wastewater treatment is proposed: fat removal by flotation and neutralization to obtain the optimal pH for the life of microorganisms, and then biological treatment using active sludge. The biological sludge obtained in this way is used as fertilizer in agricultural fields [6-9].

For this purpose, the composition of waste water from fat and oil enterprises has been studied. The results are shown in table 1.

As the results of analyzes show, the anionic and cationic composition of wastewater is much higher than the MPC norm. Particularly high values for suspended solids and water hardness.

Table 1. Composition of waste water from fat and oil production

Cations	Content per liter		**Other indicators**	
	mg / l	% - eq / l		
Na^+	211	80	Hardness mEq / l: total	17,50
K^+	44	1	Carbonate	17,50
NH_4^+	1,0		Non-carbonate	-
Ca^{2+}	900	35	pH	3,90
Mg^{2+}	882	57	CO_2 free mg / l	G.m
Fe^{3+}	<0,3		CO_2 agr mg / l	
Fe^{2+}	1,2		SiO_2 mg / l	
Total		100	Dry residue: mg / l	
Anions			Experimental	9460 mg / l
			Calculated	8020 mg / l
Cl^-	532	12	**Physical properties**	
SO_4^{2-}	5448	88	Transparency	Transparent after filtration
NO_2^-	<0,01		Taste	Strongly salty
NO_3^-	<1		Color	No color
CO_3^-	-		Smell	Without smell
HCO_2^-	-		Sediment	A precipitate forms on standing
Total		100	Suspended substances, mg / l	209

For wastewater treatment, a previously developed [10,11] adsorbent reagent, carbonized defecate waste from sugar production and activated bentonite were used (activation was carried out with 10% sulfuric acid for 1 hour with gentle stirring, then neutralized to pH 7 and dried in drying cabinet 100-105 ^oC to constant weight) of the Askamar deposit and their compositions. In this case, the amount of adsorbent was 5% of the total mass of water. The pH of the water was 3.5, and the transparency was 220. The results obtained are shown in table. 2.

Table 2. Wastewater treatment by the proposed adsorbent reagent and their compositions

Adsorbent type	pH	Water transparency
Carbonized defecate and activated bentonite of the Askamar deposit in a ratio of 1: 9. (K-1)	9,10	
Carbonized defecate and activated bentonite of the Askamar deposit in a ratio of 1: 7. (K-2)	8,12	
Carbonized defecate and activated bentonite of the Askamar deposit in a ratio of 1: 5. (K-3)	7,2	
Activated bentonite of the Askamar deposit. (control)	39	5,8
Carbonized defect (control)	9,2	

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As can be seen from table 2. with a decrease in the amount of activated bentonite of the Askamar deposit, the pH of the water and the transparency decrease to the MPC norms. This is especially noticeable when using the composition K-3, where the charred defecate and activated bentonite of the Askamar deposit in a ratio of 1: 5 the pH is 7.2 and the transparency is 0.44.

Further, the effect of the compositions on the composition was studied after purification and chemical analysis was carried out. (Table 3.)

As can be seen from Table 3. with the use of the proposed compositions of the reagent-adsorbent K-3, the indicators were much improved than the initial ones (Table 1). This once again confirms the correctness of the selection of the compositions of the adsorbent reagent in the amount of 5% of the total amount of wastewater.

Table 3. Composition of wastewater from oil and fat production after purification by the proposed compositions of reagent-adsorbents

Cations	Content per liter		**Other indicators**	
	mg / l	% - eq / l		
Na^+	211	80	Hardness mEq / l: total	4,00
K^+	7	1	Carbonate	4.00
NH_4^+	1,5	1	Non-carbonate	-
Ca^{2+}	20	9	pH	6,60
Mg^{2+}	12	9	CO_2 free mg / l	G.m
Fe^{3+}	<0,3		CO_2 agr mg / l	
Fe^{2+}	<0,3		SiO_2 mg / l	
Total		100	Dry residue: mg / l	
		Anions	Experimental	1929мг/л
			Calculated	702мг/л
Cl^-	28	7	**Physical properties**	
SO_4^{2-}	67	12	Transparency	Transparent after filtration
NO_2^-	<0,01	-	Taste	Strongly salty
NO_3^-	145	20	Color	No color
CO_3^-	No	-	Smell	Without smell
HCO_2^-	421	61	Sediment	A precipitate forms onstanding
Total		100	Suspended substances, mg / l	205

Next, microbiological analyzes of the initial and treated wastewater were carried out with the proposed compositions. Determination of the total microbial number was carried out by inoculating an aqueous sample on a solid nutrient medium (meat-peptone agar) [12].

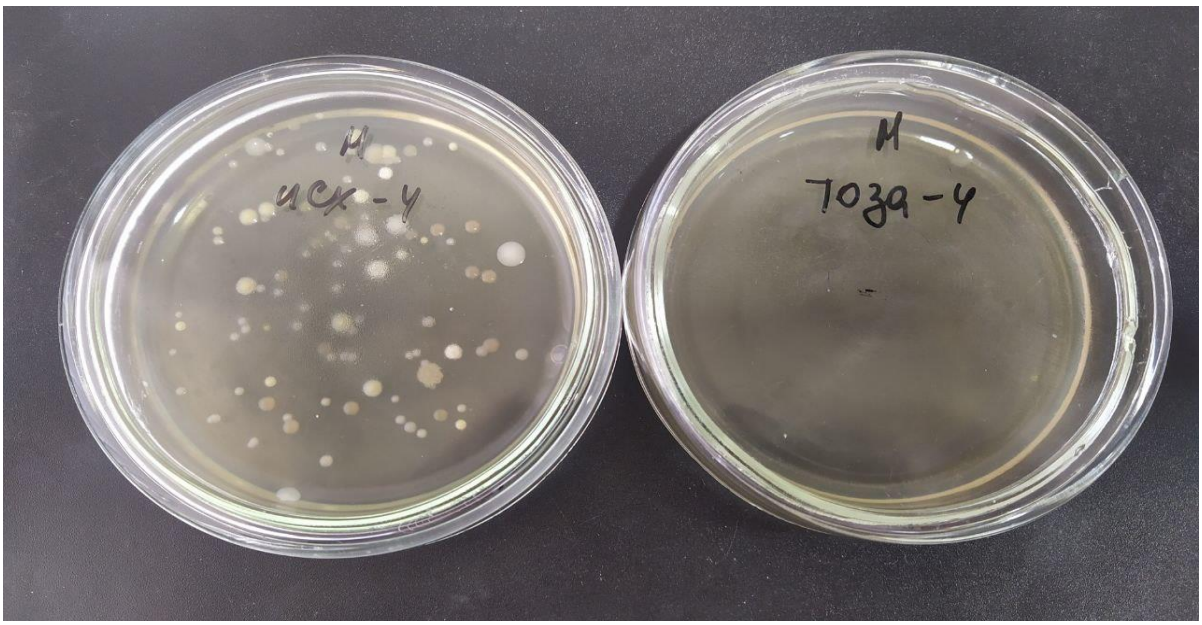

Fig. Drawings before and after cleaning with the proposed adsorbent reagents

As can be seen from the figure, bacteria multiplied in the initial wastewater samples after microbiological tests, however, bacteriological appearance was practically not detected in the purified sample.

CONCLUSION

Thus, the use of charred defecate and activated Askamarsky bentonite in a ratio of 1: 5 will allow to purify wastewater from oil and fat production to pH-7.2 and transparency of 0.44, and the water hardness is also reduced from 17 mg-eq / l to 4.0 mg -eq / l. This will allow the recycling of wastewater for technical needs.

REFERENCES

1) Ecology and Economics of Natural Resource Use / Edited by E.V. Girusova - M.: UNITY-DANA, 2007.
2) Blagadyreva, A.M. Evaluation of the effectiveness of the use of thermally modified defecate for the purification of wastewater from oil products and explanation of the mechanism of the water purification process // Ecology, energy and resource conservation, environmental protection and human health, waste disposal: abstracts. report International Scientific and Practical Conference, 2009 Kharkov, Vol.2. S. 333 -334.
3) Sverguzova Zh.A. Wastewater treatment with modified defect / Zh.A. Sverguzova // Ecology of human health. Protection of air and water basins. Waste utilization: collection of scientific articles of the International Scientific and Practical Conference / Shelkino (Ukraine), June 4-8, 2007, Kharkiv: Ryder. Vol. 1. -WITH. 219-220.
4) Usmanov RM, Eshmetov I., Salikhanova D., Agzamova F., Eshmetov R., Sharipov A. Physical-Chemical Properties of Thermoactivated Defecate for Purification of Acid Waste Waters // International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-9 Issue-2, December 2019.P. 1184-1186.
5) Berezutsky V. V. To the question of the possibility of utilization of fat-containing wastewater generated at the enterprises of the oil and fat industry / V. V. Berezutsky, V. V. Gorbenko, I. A. Mezentseva // Eastern-European Journal of Advanced Technologies = Eastern - European journal of enterprise technologies. - 2011. - No. 6/8 (54). - S. 57-60.
6) Nadysev V.S. Wastewater treatment in the oil and fat industry. - M .: Food industry, 1976.
7) Yaromsky V.N. Wastewater treatment for food and processing enterprises. Minsk: Ed. Center BSU, 2009.171 p.
8) Kuznetsova LS, Snezhko AG, Borisova ZS et al. Purification and disinfection of waste water from processing enterprises of the agro-industrial complex // Food industry. 2002. No. 10. S. 52-53.
9) Bazaryan M.M., Berezutsky V.V. Purification of fat-containing effluents in column electric coagulators. Oil and fat industry, 1984, No. 8 pp. 29-31.
10) Salikhanova D.S., Azimova D.A., Eshmetov I.D., Umirov F.E. .41-47
11) I.D. Eshmetov, R.M. Usmonov, D.S., Salikhanova, F.N. Agzamova, S.R. Shamuratova. Neutralization of acidic effluents of fat and oil enterprises with modified defect // "Composite materials" Tashkent. 2019. No. 2. S. 109-111.
12) Methodology "SanPiN 2.1.4.1175-02 Hygienic requirements for water quality in decentralized water supply. Sanitary protection of sources. "," Determination of the total microbial number.