

Technologies for Treatment of Waste Oil and Oil-Fat Industries

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Abstract: In this thesis technologies for treatment of waste oil and oil-fat industries are given. Authors give information about composition of oily waste. Despite the measures taken, in particular the construction of additional distillation plants and the search for new areas of application, so far not more than half of the generated fat and oil waste is used.

Keywords: Fat, neutralization, degreasing, decolorization, soap stock,

Most of the fat and oil enterprises in Uzbekistan, where cotton soap stock is processed, do not have local treatment of urgent water. This leads to pollution of canals, rivers, water bodies. Therefore, since 1980, at the Andijan and Kattakurgan oil and fat factories, work has been carried out on local treatment of waste water from fatty acid distillation shops according to the following scheme: neutralization, degreasing, decolorization [1].

Part of the produced soap stock is clarified by decomposition of fats, followed by distillation of the resulting crude fatty acids.

Soap stocks formed during the neutralization of cotton oils and fats differ in total fat content, the ratio of neutral and bound fat, and the presence of accompanying substances. In particular, cotton soap stocks of the Tashkent Oil and Fat Plant contain 40.8-61.2% total fat, 16.2-22.4% neutral fat, 3.6-6.2% non-fatty substances, 9.0-30.6% moisture. The average composition of fatty acids in soap stock: C14-1.3%, C16-42.8%, C18-23.2%; average molecular weight [2].

According to one of the processing technology, soap stock is saponified by cooking with alkali, so-called glue is obtained, which is treated with concentrated sulfuric acid, while brown fatty acids containing gossypol are released. After washing with water until neutral, crude fatty acids (FFA) with an acid number of 180-200 are obtained. The settled water is drained, the FFA is transferred to the receiver and then to the dryer (70-800C) and the heater (120-1300C), from where they are sent to a 9-section continuous distiller operating under vacuum, where the temperature rises from section to section from 190 to 2500C.

Heated, in the remote sections, the FFA are distilled with the help of bubbling steam. After cooling, the FFAs condense and drain into the collector. Low-boiling acids and partially condensed water vapors from the trap flow into a collection tank, where,

after settling from water, fatty acids are pumped out by a pump into a collection of distilled fatty acids. Residues from the last section of the cube are collected in a special receiver and sent for processing [3].

The composition of oil sludge is represented by an extensive list of component ratios. Analysis of the literature data on previously conducted studies of NSOs in various regions of Russia shows that they are characterized by a wide range of composition, however, they have a general tendency for the physicochemical characteristics of layered components of NCO storage rings. The results are shown in Table 1.[4]

Composition of oily waste

Component content, % wt	Source of education				
	NefteshamChinaz Refinery	Oil-sludge of Jarkur-Gan oil refining	Oil sludge Fergana refinery	Oil sludge from the Bukhara refinery	
Water		48,4	41,2	28,2	49,0
Fractions boiling up to 350 ° C	81-98	18,3	77,7	38,2	22,6
Asphaltenes	14,1-3,9	12,8	1,8		
Resin	44,0-9,5	17,5	14,9		
Mineral part		3,81	2,24	33,6	28,4
Sulfur		3,8	0,01	0,74	0,86
Content component, % wt	Education source, link				
	Ural region [104]				
	NPC4	NPC3	NPC1	NPC2	
Water	0,27	1,8	12,8	1,5	19,9-55,8
Fractions boiling up to 350 °	8,0	12,0	84,5	5,85	13,7-15,7
Asphaltenes	7,97	9,38	6,61	8,9	0,7-2,7
Resin					0,3-0,7
Mineral part	0,09	0,99	39,7	6,5	28,5-63,2
Sulfur	2,45	2,82	1,38	4,29	

Extracts from NS in methylene chloride, hexane, acetone and chloroform are complex mixtures of hydrocarbons of various structures, including saturated

hydrocarbons from tridecane ($C_{13}H_{28}$) to triacontane ($C_{30}H_{62}$), cycloparaffins, alkylbenzenes, naphthalenes, PCA, oxygen-containing compounds [4].

Conclusion

In the stripped sludge, alkanes C_{17} - C_{35} prevail in close amounts (4-6%). The fraction boiling away at 350-495 is mainly represented by C_{19} - C_{26} hydrocarbons. The group composition of the hydrocarbon part of the oil sludge is presented in Table.

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