INTERNATIONAL BULLETIN OF MEDICAL SCIENCES AND CLINICAL RESEARCH
UIF = 8.2 | SJIF = 5.94
IBMSCR
ISSN: 2750-3399

APPLICATION OF IONIC-MACHINING COMPOSITE MATERIALS BASED ON DIMETHYLOL(THIO)UREA IN THE BLEACHING OF OIL IN THE OIL INDUSTRY

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https://doi.org/10.5281/zenodo.7206856

Abstract. In this article, the bentonites are compared with the main bentonite deposits of the CIS countries. In addition, as the time of modification with the polymer compound increases, the adsorption properties of bentonites increase, the color of the oil increases red and blue units. up to 7.9 red, up to 0.1 blue units, and the oil yield reaches 97.9%.
Keywords: sorbtion, oil, bentonite, clay soil, modification.

Introduction. According to the general definition, a membrane is a part where mass transfer occurs between two phases of substances under the influence of different moving forces [1]. The passage of substances through membranes can occur under the influence of concentration difference (osmosis, dialysis), electric potential difference (electroosmosis, electrodialysis) or pressure difference on both sides of the membrane (reverse osmosis, ultra) [2]. Currently, several hundred membrane materials are known, and about 50 of them are ion exchange membranes. Two developments stimulated the industrial use of charged synthetic membranes: the discovery of the high electrical conductivity of bulk ion exchangers by Hayman and O ' Donnell in 1948; the convenience of using bipolar ion exchange membranes in an electrodialysis apparatus for water desalination was found (Maer and Strauss in Germany and Jude and McRae in America, 1953). The wide range of membrane applications allows for the solution of many environmental problems, treatment methods and efficient methods of resource use [3].

Experimental part. The dark mixture obtained on the basis of dimethylolthiourea: orthophosphoric acid was dried in a drying cabinet at a temperature of 120 ºC for 8 hours without forming a membrane. The resulting solid is ground in a porcelain mortar. Raw bentonite brought from a special quarry is crushed in a porcelain mortar to the above size, both powdery substances are soaked in distilled water and mixed in a ratio of 1:2. Mixing is done manually in a porcelain mortar for 20-35 minutes. The resulting mixture is dried under UV rays for 3-6 hours at 70-80°C.

IBMSCR | Volume 2, Issue 10, October

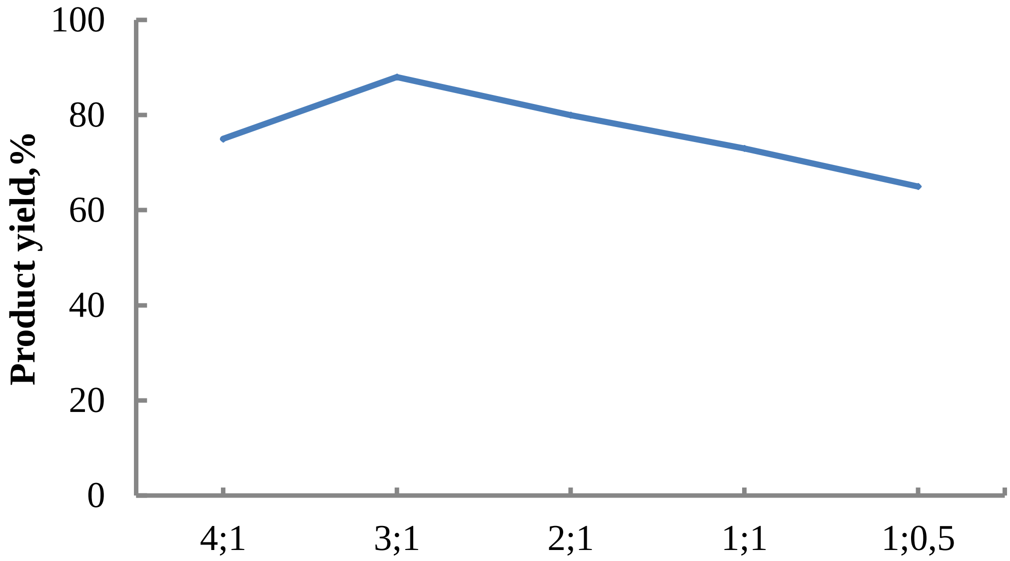

Figure 2. Dependence of the interaction of the starting substances on the yield of the product. T=70-80 °C, time 6 hours

Analysis of results. The color of unrefined and refined cottonseed oil is measured using the Lovibond color meter. The Lovibond colorimeter consists of an eyepiece and color filters, and the color of the oil is compared to standard colors. Color filters consist of colors in blue, yellow, and red units. In the Lovibond color meter, the color filters are arranged in the following order, that is, the first row above has 0.1 to 0.9, the second row has 1.0 to 9.0, and the third row has color filters from 10 to 80 in red units. The placement of the yellow filters is in the same order as the placement of the red filters. The arrangement of the blue filters is the same as the arrangement of the yellow filters, except that the filters in the last row have yellow units of filters from 10 to 30. Color measurement of oils The color of unrefined cottonseed oil is measured in a 1 cm cuvette, while the color of refined cottonseed oil is measured in a 13.5 cm cuvette. A cuvette with oil is placed on the colorimeter and the light is turned on using a special button, and we see a sphere divided into two different colors depending on the eyepiece. The left part of this sphere shows the color of the oil to be analyzed, the right part consists of a standard color filter and shows the color of the oil. The color of the left side of the balloon should be the same as the color of the right side, that is, using standard color filters, you should make both sides of the balloon the same. For this, 35 yellow filters are first placed, and then filters of the red unit depending on the colors are placed. If the two sides of the sphere are not the same, blue filters are used. The process of color measurement is considered complete after making both sides of the ball the same. After that, all installed color units are written. The red unit value is written first, then the blue unit value, and finally the yellow unit value. To determine the color of the next oil sample, the cuvette is rinsed with this oil sample and the measurement process is performed in the same sequence as above [4].

All coloring substances in oils and fats are different in nature and structure. But each of them has its own polarity. When an activated adsorbent is used in the bleaching process, a small amount of isomerization and the formation of glycerides containing sequentially linked fatty acids are observed. This, of course, leads to a decrease in the quality of refined oils and

fats and a shortening of their shelf life[5,6]. Therefore, polarized sorbents with selectivity and activity are used in sorption refining. For this, bentonite modified into an activated clay sorbent is used. These bentonites are obtained from natural bentonite soils - aluminosilicates. At present, activated adsorbents are brought from foreign countries and used for adsorption purification of vegetable oils in various sectors of our oil industry [7,8].
Cotton oil bleaching processes using acid-activated sorbents were carried out above. Whitening processes were carried out using activated adsorbents in the amount of 2% for different periods of time. The obtained results are presented in Table 1.1.
Table 1.1
Effect of activation time on oil whitening process

Name of the sorbent	Activation time, hours	Oil acid number, mg KOH/г	Oil color 35 yellow and 12.5 cm thick Cuvette		Oil output %
			Red unit	Blue unit	
КФАФ-1-Б	initial	0,3	15,1	0,2	-
	2	0,1	7,9	0,1	97,9
	4	0,1	7,2	0,1	95,8
	6	0,4	7,2	0,0	94,4
Pakistan bentonite	4	0,3	8,3	0,1	97

As can be seen from Table 1.1, the indicators of refined oil with the help of sorbents obtained as a result of activation for 4 hours showed the best indicator. Therefore, 4 hours was taken as an optimal condition for further activation processes. For our further work, it was planned to carry out on the KFA-1-B sorbent, because it was found that this sorbent cleans oil better than the KFF-1-B sorbent. The maximum amount of adsorbent used for acid concentration and bleaching was used above. At the next stage, research was conducted to find the optimal conditions for the concentration of acid and the amount of adsorbent. The obtained results are given in the following tables 1.2-1.3.
Table 1.2
Effect of acid concentration on oil bleaching

Acid concentration, %	Oil acid number, mg KOH/g	Oil color 35 yellow and 12.5 cm thick Cuvette		Oil output %
10	0,1	7,7	0,3	98,2
15	0,1	7,7	0,2	98
20	0,1	7,6	0,2	97,6

Table 1.3
The influence of the amount of sorbent on the oil whitening process

Amount of sorbent, %	Oil acid number, mg	Oil color 35 yellow and 12.5 cm thick Cuvette	Oil output %

	KOH/g			
1	0,2	7,7	0,2	98,8
2	0,2	7,5	0,2	98,4
3	0,2	7,5	0,1	97,9

From the tables 1.2 and 1.3 above, the most optimal condition for the activation of the sorbent was determined using 15% H_2SO_4 acid for 4 hours. In addition, it was determined that the sorbent consumption for bleaching is 2%. In conclusion, optimal conditions for obtaining import substitute sorbents for oil purification using synthesized sorbents were determined. According to it, it was found that KFF-1-B sorbent has higher sorption properties than KFA-1-B sorbent. In addition, it was determined that the optimal conditions for activation are 4 hours of activation with 15% H_2SO_4 acid. It was found that the use of 2% in oil whitening with the help of the obtained sorbents leads to maximum oil purification [9].

Summary. Thus, in this research work, adsorbents used in the oil refining industry were obtained. The efficiency of the bleaching process was determined by the color of the bleached oil, the amount of sorbent used, the level of loss and waste, and the output of the bleached oil. The amount of bleaching sorbents used depended on the amount of dyes in the oil to be cleaned and the degree of bleaching required.

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