ETHIOPIAN INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

eISSN: 2349-5715 pISSN: 2349-5707

Volume: 11, Issue 02, Fev-2024 SJIF 2019: 4.702 2020: 4.737 2021: 5.071 2022: 4.919 2023: 6.980

EFFECTS OF LOCAL ADSORBENTS FOR THE PURIFICATION OF COTTON OIL AND ITS PROCESSING PRODUCTS

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Annotation: Technological methods for purifying raw cottonseed oil indicate that the quality and nutritional benefits of refined oil mainly depend on the content of free fatty acids, phospholipids, gossypol and its derivatives, as well as other substances. The reduction and complete removal of some oil-related substances can significantly improve the performance of the final product. Purification of crude oil and ensuring high performance of the final product also depend on the nature of the feedstock and methods of production of cottonseed oil.

Key words: Modernization, diversification of industry, resources, energy-saving methods, food safety, products, alkaline neutralization, refined cottonseed oil, local clays, chemical composition, ascanite-bentonite, bound gossypol, sorption, unwanted components, cotton lard, adsorption activity.

Currently, the world's demand for vegetable oils is growing. Production of vegetable oils in 2019 amounted to 15.0 million tons in the USA, 3.5 million tons in Russia, 36.0 million tons in China, and 70.0 million tons in Central Asia. and in Europe 26.0 million tons.

In the world, increasing attention is being paid to research work on the extraction of vegetable oils from oilseed raw materials in order to improve the quality and ensure the food safety of products obtained from them. The above can be solved by developing and introducing new intensive and resource-saving technologies into industry and organizing waste-free production.

The action strategy (2017-2021) for the further development of the Republic of Uzbekistan specifies the tasks "...to develop industries, modernize and diversify industry, use resources and energy-saving methods, ensure food safety of products, produce competitive and export products for import substitution...".

Refining vegetable oils and fats is one of the most important technological processes of fat processing. Refining technology, namely, alkaline neutralization of raw cottonseed oil, consists of a complex of complex physical, chemical and physicochemical processes, on which the physicochemical characteristics and quality indicators of refined oil mainly depend. Technological conditions, yield and quality indicators of refined cottonseed oil are also determined by the nature and method of production of raw oil, the composition and quantitative content of impurities in it, as well as related substances. The selection of an effective adsorbent for the refining of cotton wool requires an in-depth study of its mineral and chemical composition, as well as structural properties. Optimal technological regimes for the partial neutralization of raw cottonseed oil have been determined, ensuring maximum removal of phospholipids, gossypol and its derivatives, and tocopherols from the raw material at the stage of preliminary refining.

Establishment of optimal technological regimes for alkaline refining of raw cottonseed oil, ensuring increased yield, improvement of the quality and nutritional value of refined cottonseed oil, establishment of the effectiveness and technical and economic indicators of new scientific and technological developments.

In Uzbekistan, the most developed from the point of view of industrial use are the following types of clays:

- Bentonite from the Navbakhar deposit;

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- Azkamar bentonite;
- Tul-Sokh palygorskite;
- Opoka-like clay Kermine.

All these clays were subjected to chemical analysis at the Central Laboratory of the Ministry of Geology of the Republic of Uzbekistan.
The results obtained are presented in table. 1

Table 1

Chemical composition of selected local clays

ay mponents	n absolutely dry matter, %			
	skanite Bentonite (Georgia ntrol) x)	ntonite from th avbakhar deposit	lsokhi lygorskite	oka cla ermine
O_2	,14	,91	,9	,8
$_2O_3$	,74	,69	45	35
$_2O_3$	98	10	8	55
O	22		71	5
aO	41	48	,33	,56
O_2	38	35		3
gO	64	84	25	48
O_3	07	75		9
a_2O	82	53	84	06
O	64	75	34	25
n.	,94	,17	,2	,10
умма	,98	,97	,82	,85
O	71	12	15	56

Note: x) this clay was used for comparison with local ones as a control.
As can be seen from table. 1. Local clays are very different in chemical composition from the well-known ascanite-bentonite (Georgia), used in the bleaching of vegetable oils.
Moreover, all clays (except opoka-like) require acid activation, which makes it possible to increase their adsorption activity.
In laboratory conditions, we treated the clays with a 15% solution of H_2SO_4 for 6 hours. Then, the resulting samples were washed with water until neutral, dried and crushed to a powder state. The finished adsorbents were stored in desiccators.
In laboratory conditions, cotton lard, grade 4 (calorific value = 0.31 mg KOH/g), color (according to VNIIZh-12 = 4), peroxide number 10.0 mmol/kg and nickel content 0.7 mg were subjected to adsorption

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purification /kg at a temperature of 90±5^{0}C for 1 hour.
In table Figure 2 presents the results of adsorption post-purification of cotton wool on selected clays.

table 2

Refining ability of local clays of cottonseed oil

dicators of cotton salomas	scanite entonite eorgia)	entonite from th avbakhor deposit	lsokhi lygorskite	poka cla ermine
cid number, mg KOH/g	26	21	25	26
olor according to VNIIZH				
roxide value, mmol/kg	0	2	5	7
ckel content, mg/kg	5	27	35	38
lterability at 1% adsorben /5 sec, at 90^{0}C	,1	,8	,0	,4

As can be seen from table. 2 bentonites from the Navbakhor deposit showed the greatest adsorption activity (purification). Therefore, for further research we used these adsorbents. When studying the fat content, the selected clays had the following indicators: bentonite from the Navbakhor deposit - 42.3%, Tul-Sokh palygorskite - 48.1% and opoka-like clay from Kermine - 51.0%.
Consequently, local bentonites, due to their technological properties and adsorption activity, can well be used for the adsorption purification of cotton lard.
The results of the study showed that despite the identical conditions of the adsorption process, minerals exhibit selectivity in the sorption of undesirable components of cotton lard. For example, bentonites are good at sorbing free fatty acids, while opoka sorbs residues of metals, soap, etc.

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