International Journal of Advance Scientific Research
(ISSN – 2750-1396)
VOLUME 02 ISSUE 06 Pages: 55-61
SJIF IMPACT FACTOR (2021: 5.478) (2022: 5.636)
METADATA IF – 7.356
Crossref doi Google Scholar METADATA INDEXING WorldCat MENDELEY
ISSN-2750-1396

Journal Website: http://sciencebring.com/index.php/ijasr

Research Article

ADSORBENT USED IN INDUSTRY AND PROBLEMS IN THEIR USE

Submission Date: June 10, 2022, **Accepted Date:** June 20, 2022,
Published Date: June 30, 2022
Crossref doi: https://doi.org/10.37547/ijasr-02-06-08

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ABSTRACT

The article provides scientific information about adsorbents, filters and their use in industry.

KEYWORDS

Oils, chlorophylls, salomas, adsorption, filtration, suspension, filter.

INTRODUCTION

Oils contain pigments that color the oil. For example: xanthophylls give oil a yellow color, V-carotene red, chlorophyll - green; gossypol - gives a brown or black color.

Catharinoids are resistant to alkali, so they do not separate in alkaline refining. If the concentration of the alkaline solution is high, during neutralization, carotenoids are absorbed by the soap stock and the oil is partially whitened (clarified). Carotenoids are actively sorbed on the solid sorbent surface [1-3].

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Unlike carotenoids, chlorophylls react with alkali and form compounds. However, it is not completely separated in alkaline refining. Sunflower oil contains carotenoids and chlorophylls, while cottonseed oil contains gossypol along with them [4-6].

THE MAIN PART

Refined oil and salomas should have a clear color, it is very necessary for the production of butter. Adsorption cleaning method is used to remove dyes from oil.

Adsorption is the process of gathering molecules and atoms of other substances on the surface of a solid or liquid substance. Adsorption reduces the surface energy of the active centers on the surface of the adsorbent under the influence of molecular force.

Good adsorption depends on the nature and structure of the adsorbed substances. For example: non-polar (low-polar) compounds are well sorbed on non-polar adsorbents (coal) and polarized compounds are well sorbed on polarized sorbents [7-9].

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The adsorbents used in the oil refining industry should have a high adsorption capacity and an active, developed surface, a small oil capacity, and should not chemically react with the oil and be easily separated from the oil [9-12].

Activated earth-ascanite developed in MDX is used in the oil refining industry, its oil capacity is 75%.

The amount of sorbent depends on the amount of dyes in the oil, it ranges from 0.5 to 5%.

The efficiency of the bleaching process is determined by the amount of bleached oil, the amount of used sorbent, the rate of loss and waste, and the amount of bleached oil [13-19].

When activated earth is used in the bleaching process, some isomerization and some glycerides are formed. This leads to a decrease in the quality and shelf life of clarified butter and oils [17-21].

The conditions indicated above and the size of the oil capacity are used to whiten as much as possible.

Whitening time is 20-30 minutes. A long-term storage of adsorbent oil leads to its oxidation and provides an oily surface [22-27].

Hydrated, neutralized, washed and dried oils are recommended for whitening. In order to reduce

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oxidation during bleaching, the process is carried out under vacuum [28-32].

In recent years, in our country and abroad, hermetic filters for mechanical removal of sediment of various constructions have been installed, and continuous whitewashing methods are being introduced.

The justification process for all methods is as follows:

- Preparation of oily suspension of adsorbent;
- Deaeration, bleaching process;
- Extracting the adsorbent using a filter
- During the bleaching process, the temperature is 75-80 °C, the residual pressure in the bleaching apparatus is 4 kPa (around 40 mm. wire).

The oil is drawn from the box (1) to the whitening apparatus with the help of a vacuum, heated to 90-95 °C. 40-60 mm. s it is dried under pressure. Then the whitewash is pulled out. Oil and soil are thoroughly mixed for 20-30 minutes. At the end of whitening, it is sent to the filter press with an oil pump. Dark oils are collected in a collection box, and clear oils are collected in a collection box [33-37].

The pressure during filtration should not exceed 2.5-3 atmospheres, and the temperature should not exceed 85-90 °C.

Used bleaching soil contains a certain amount of fat. To reduce the amount of oil in the bleaching soil, the filter press is blown with compressed inert gas. The oil from the filter press is sent to re-refining [35-39].

The neutralized, washed and dried oil enters the tank and is sent for whitewashing with the help of a pump. Part of the oil passes through the meter, bypasses the heater, and comes to the mixer, where it is mixed with bleaching earth. The bleaching earth comes continuously from the hopper behind the auger feeder. The suspension is drawn into the clarifier and deaeration apparatus using a vacuum. The main part of the oil is sent here through the meter (consumer) and the heat exchanger.

The suspension is pumped from the bottom of the apparatus through the heat exchanger apparatus to the column-type clarifier. The level of the oil suspension is kept constant in the boiler with the help of a float adjuster. The vacuum is created with a steam-ejector pump, and the refined oil is transferred to the disc filter using the pump.

It has 2 filters installed for continuous operation. The first cloudy part of the filter is returned to the complete bleaching apparatus. The quality of the filtrate is monitored by a flashlight. Clean, clear oil is then sent for recycling.

If a certain amount of sediment accumulates in the filter, its production capacity decreases, the pressure increases to 0.35-0.38 mPa (3.5-3.8 kgs/cm2), and filtering is stopped.

2- filter is activated, 1- filter is activated. After the filter is stopped, the remaining oil is poured into the tank. It is returned to filtration with a ground

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pump. The deposit on the disc is first blown with steam and then blown with hot air to degrease the deposit. The water-oil mixture is poured into the tank, where it is precipitated. The sediment on the discs is loosened.

Production capacity is 5 t/h refined oil.

Sulfuric acid breaks down the salts of fatty acids in oils. Strong sulfuric acid is used in the refining of oils containing impurities that are difficult to remove by other methods. An example of this is the processing of badly contaminated rapeseed and rapeseed oils. The sulfuric acid refining method is also used in the preparation of oils for cracking.

Conclusion

Refinement with concentrated sulfuric acid is carried out in an apparatus with an acid-resistant coating. It should be equipped with a mechanical agitator and a distributor designed for acid. The temperature of the oil should not be higher than 20-25 °C in order to prevent unpleasant effects with strong acid. Consumption of 90-95% acid is in the range of 0.5 to 1.5%, in some cases up to 2.5%. The amount of acid depends on the quality of the oil being refined: the more mucus, protein and dyes it contains, the more acid is needed.

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