STUDY OF THE TECHNOLOGICAL CHARACTERISTICS OF LOCAL WHITE LAND

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The quality and consumer properties of vegetable oils and fats mainly depend on the degree of their purification, in particular, on the technology of their bleaching [1,2].

Recently, many bleaching agents have been proposed for bleaching oils and fats [4].

In Uzbekistan, there are sufficient reserves of land and clay, which can be used as bleaching agents. In this regard, the study of methods of bleaching agents seems to be an urgent issue.

The filtering capacity of bleaching earths was estimated by the time of filtering a certain volume of oil through a specially prepared cake of bleaching earths.

A portion of 50 ± 0.1 g of deodorized sunflower oil was placed in a 150 cm^3 beaker, and a portion of bleaching earth 5 g was added with stirring. The resulting suspension was heated to t = 90°C with continuous stirring, after which it was transferred to a previously prepared Buchner funnel connected to a Bunsen flask connected to a vacuum pump and placed in an oven.

Preliminary preparation included exposure of a Bunsen flask with a Buchner funnel in an oven at t= 80°C for 30 minutes. Then moistened with refined deodorized sunflower oil, the paper filter was placed in a Buchner funnel.

After transferring the oil suspension of bleaching earth to a Buchner funnel and filtering the entire amount of oil, a cake was obtained on the filter surface, on which cotton refined deodorized oil heated to t = 90°C was placed in an amount of 100 cm^3.

The filtration rate was calculated as the ratio of the volume of oil to the time of its filtration.

To determine the oil absorption, the cake obtained in the above experiment was used, but at the same time, a Buchner funnel with a filter soaked in refined deodorized cottonseed oil was preliminarily weighed. After completion of the process of determining the filtering ability, the cake formed on the funnel was blown with air for 10 minutes to remove the maximum oil.

After releasing the vacuum and cooling the funnel for 5 minutes, weighing was carried out.

Oil absorption was determined by the formula

$$X = [P_1 - (P_2+P)] \times 100/P + [P_1 – (P_2+P)]$$

where P_1 - is the weight of the funnel with the filter, bleaching earth and absorbed oil, g;

P_2 - is the weight of the funnel with the filter impregnated with oil, g;

P - sample of bleaching earth, g.

Determination of bleaching earth activity

Under the activity of bleaching earths, their integral adsorption activity in relation to the pigments contained in the oil was taken. Activity was calculated using the formula

$$A = [(C_1 – C_2) \times 100] / C_1$$

where A - is the activity of bleaching lands, %;

C_1 - color number of the original oil, units. J_2;

C_2 - color number of bleached butter, units. J_2.

The particle size distribution of bleaching earths was determined on a laser particle size analyzer Fritsch Particle Size analysette 22 [3].

The principle of the method is as follows: the shape of the vast majority of real particles obtained in the process of grinding differs to a greater or lesser extent from the sphere, therefore, the “equivalent sphere diameter” parameter is used to describe the dimensional characteristics. This is the diameter of a sphere that has the same volume (or weight) as a real particle.

The laser diffraction method is used to measure the particle size. This method is based on the fact that it is not the particles themselves that are recorded, but the scattered light from these particles (or the diffraction pattern). The light scattering angle is universally proportional to the particle size.

In the used particle size analyzer Fritsch Particle Size´analysette 22´ laser light shines through the cuvette with the analyzed sample and is scattered on the sample particles.

The experimental values of the scattering indicatrix are obtained by averaging the light scattering data recorded every 2 ms. During the study, all particles have time to pass through the measuring cuvette several times, which ensures stable and highly reproducible results.

The structure of bleaching earths (specific surface area and pore volume), which characterizes adsorption properties, was determined on a Sorbometer-M specific surface analyzer [3]. The principle of determination is based on the use of the method of thermal desorption of gas-adsorbate (nitrogen) from the surface of the studied materials under dynamic conditions. A stationary flow of helium-nitrogen mixture (gas mixture) with a given composition is passed through the adsorber with the sample placed in it. As a result of sample testing, the volume of adsorbate gas absorbed by the sample during cooling (adsorption) and desorbed during heating is measured. As a result of measuring the volume of gas adsorbed at liquid nitrogen temperature with different proportional composition of the gas mixture, an adsorption-desorption isotherm is constructed.

The elemental composition of bleaching earth was determined on an ARL OPTIM'X X-ray fluorescence spectrometer [3]. This method is based on the determination and subsequent analysis of the spectrum obtained by exposing the material under study to X-ray radiation.

Thus, the studied methods for analyzing and evaluating the performance of bleaching agents make it possible to use them in industrial practice.

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