

Possibility of producing a substitute for the imported Fuller's earth used in bleaching edible oils.

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ABSTRACT

This research aims to study the potentiality of finding out a substitute for the imported bleaching earth used for bleaching edible oils .

Physicochemical properties of two kinds of imported bleaching earth "Engelhard and Tonsil" as well as three kinds of local earth " Red Sea, Sinai and Aswan" were estimated. It was noticed that both kinds of the imported bleaching earth (Tonsil and Engelhard) are characterised by high surface area (201 ± 4 , 178 ± 2 m²/g) , high moisture contents, high cation exchange capacity and higher content of silicon dioxide (60.29%, 66.33%). The study showed also that the kinds of the local natural bleaching earth are characterized by relatively lower surface area (46 ± 3 , 33 ± 2 , 26 ± 1 m²/g) , lower cation exchange capacity, moisture contents and lower contents of silicon dioxide (44.9, 38.67 and 35.3%, respectively).

The study showed that the process of bleaching oil by using natural local earth (without treatment) is related to weak reducing in the red color, saponification value and unsaponifiable matter. Whereas, it increased acid value, peroxide value and thiobarbutric acid compared with the effect of the foreign bleaching earth. From the obtained results it was found that the local earth (Red Sea) is characterized by good ability of reducing the color, sterols (by GLC) and tocopherols (HPLC) compared with the other kinds of local earth obtained from Sinai or Aswan. The study showed that the value of particle size of bleaching earth plays an important role in the efficiency of bleaching earth to bleach oil. It was found that the lowest particle size (100 micrometer) is characterized by its high ability in bleaching oil compared with larger particles (150-200 micrometer).

Results showed also that, the activated local earth obtained from the Red Sea region was the most efficient kind compared with the other local earth (Sinai and Aswan). The mixing of the foreign bleaching earth (Tonsil) or activated carbon at (10, 20, 30 and 40%) with activated local earth (Red Sea) improved both the bleaching process and the physical and chemical properties of cottonseed oil. It was noticed that the efficiency of local earth in bleaching oil was increased by increasing percent of mixing with the foreign bleaching earth, as well as the percent of applied activated carbon.

INTRODUCTION

Crude oils and fats contain varying amounts of substances that may cause an undesirable flavor, color or odor. Unrefined or crude oils are subjected to a number of commercial refining processes, both physical and chemical (namely degumming, neutralization, bleaching and deodorization), designed to remove these materials. The bleaching materials used in the Egyptian edible oil industries are imported from different foreign countries . Natural earth , activated earth , and activated carbon are the three types of