
EXPERIMENT 3 EXTRACTION OF FISH BODY OIL

Structure

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3.1 INTRODUCTION

Oil occurring outside the liver of fish, especially in the musculature, is called body oil. Species of fish with high body oil content (fatty fishes) only are used for commercial production of oil – e.g. oil sardine. Whichever method we adopt for extraction, the quality of oil must not be adversely affected. We'll follow a simple method of boiling for extraction.

Objectives

After performing this experiment, you will be able to:

- extract fish body oil on a laboratory scale; and
- familiarize with colour, odour and other characteristics of the oil.

3.2 EXPERIMENT

3.2.1 Principle

Fish is cut up into small particles and cooked. These steps help in the release of oil and water. Oil is then separated from the aqueous fraction. Oil is finally washed free of impurities and dehydrated to remove moisture.

3.2.2 Requirements

- Fish – any fatty fish like oil sardine
- Anhydrous sodium sulphate
- Stainless steel vessel, ladle
- Knife, cloth bag, cutting board, trays, stoppered bottle
- Balance
- Grinder
- Stove
- Basket press
- Centrifuge or separating funnel

3.2.3 Procedure

- 1) Wash, drain and weigh the given fish.
- 2) Slit open the belly. Remove gut and gills. Cut into pieces.
- 3) Grind using a suitable grinder.
- 4) Boil water in a stainless steel vessel (fish : water = 1 : 1 approximately).
- 5) Add the ground fish; continue boiling for about 30 minutes, with occasional stirring. In case water level drops, add sufficient water to maintain it as and when required.
- 6) Collect oil floating and keep aside.
- 7) Stop heating; allow particles to settle; decant supernatant (water-oil mixture).
- 8) Transfer solids to a cloth bag. Press using a basket press. Collect the water-oil mixture.
- 9) Pool the water-oil mixtures, transfer to a separating funnel. Allow oil and aqueous layers to separate. In case an emulsion has occurred, add sufficient quantity of table salt to break the emulsion.
- 10) Drain out the aqueous layer and collect the oil layer. (Instead of separating funnel, a centrifuge can be used for separation of oil from the aqueous fraction).
- 11) Mix the oil so separated with the oil collected earlier. Transfer to another separating funnel.
- 12) Add sufficient hot water and shake the funnel vigorously in order to wash the oil.
- 13) Allow the oil and water layers to separate. Then drain out the water.
- 14) Repeat washing, if necessary.
- 15) Transfer oil to a vessel, place it on a boiling water bath until all traces of moisture from the oil is evaporated off. (Instead of heating, oil can be mixed with about 5% anhydrous sodium sulphate and kept overnight. This will absorb traces of moisture and can then be removed by filtration).
- 16) Transfer oil to a pre-weighed, clean, dry, stoppered bottle of suitable size. Fill to minimum head space and close the bottle air-tight.
- 17) Weigh the bottle with oil. Calculate yield of oil from fish.
- 18) Examine the oil and familiarize with its odour, colour, etc.

3.2.4 Observations

Name of fish used :
Weight of fish (x) =
Weight of empty bottle (a) =
Weight of oil + bottle (b) =
Weight of oil = (b – a) = y =
Yield of oil = $y/x \times 100$ =%

Characteristics of oil

Odour :

Colour :

3.2.5 Results

The yield of oil from whole fish is %

The quality of oil is found to be

3.3 PRECAUTIONS

- Use only fresh fish. If not, the quality of oil will be affected; e.g. it may become rancid.
- Excessive heating should be avoided. Further, oil must be stored without contact with air.