FE 271 FOOD CHEMISTRY LABORATORY

EXPERIMENT 1

DETERMINATION OF MOISTURE CONTENT



What is the aim of the experiment?

- To determine moisture content of some food products by different methods such as infrared drying, vacuum drying, oven drying and distillation method.

Why is a food moisture content important?

- Water is the main ingredient of many foods and water content must be known for nutritional and quality control reasons.

- Dilution of substance such as milk, beer, cream, and butter has long been a common adulteration, which is illegal and must tested for.

Why is a food moisture content important?

- In processed and frozen foods, water can be picked up at different stages and this must be controlled.

- The quality of dried foods often depends on the levels of moisture left in them (eg. milk powder), so their moisture content must be determined.

Forms of water in foods

Water exists in 3 forms in foods:

1. **Bulk or Free water**: is lightly entrapped and therefore easily seperated from food by evaporation or drying
2. **Absorbed water:** is phsically bound as monolayer the surface of the food constituents.
3. **Bound water:** chemically bonded as water crytallization or as hydrates

Methods of moisture determination

- Drying method
- Distillation method
- Chemical method
- Instrumental Method

Procedure

1. Crush or cut your food samples

2. 

   Obtain glass petri dish (previously heated to 105 ^{o}C for several hours and stored in a dessicator)

3. 

   Weigh about 2-3 g of the crushed food sample into preweighed dish.

4

A

B

C

Place dishes in a

(A) Drying oven at 105 ^{o}C

(B)Vacuum oven at 650 mm-Hg 70 ^{o}C

(C) Infrared dryer (5 min)

5

Transfer them to a desiccator after 60 min (for A and B) and to cool, then weigh them accurately.

6 Replace the dishes into the drying oven for 30 min, then remove them to a desiccator and cool to room temperature before re-weighing accurately.

7 Repeat the drying, cooling and weighing until constant weight is achieved.

For toluene distillation method

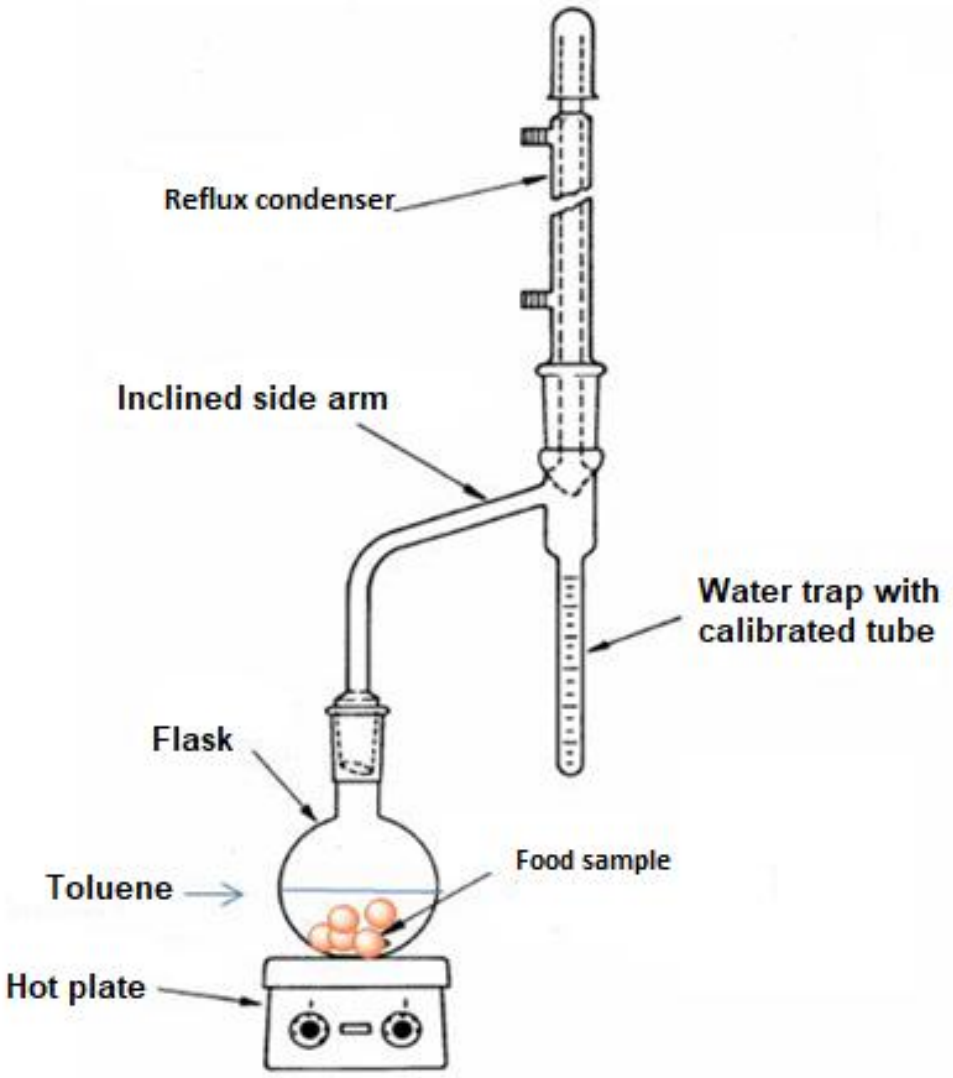
1

Weigh accurately about 5 g of white cheese in the flask

2

Insert the flask to the distillation system

Toluene Distillation



- Wheat flour
- Macaroni
- Biscuit

✓Drying oven

- Tomato paste

✓Vacuum oven

✓Infrared dryer

- Tomato

✓Vacuum oven

- White cheese

✓Distillation method

Calculation

$$Moisture_{drybasis} = 100x\left(\frac{WetWeight - DryWeight}{DryWeight}\right) \quad (1)$$

$$Moisture_{wetbasis} = 100x\left(\frac{WetWeight - DryWeight}{WetWeight}\right) \quad (2)$$

Calculation for distillation method

Moisture content (%) = $(V/W1) \times 100$

- V = volume water (mL)
- $W1$ = weight of sample before drying (g)

➢ Calculate the percent moisture content of your sample in wet and dry bases!

Discussion

- Give a brief information about your sample (e.g. its composition).
- Why you choose the method that you used?
- Compare your result with TSE or Codex. Explain if your result is in the range or not. If it is not in the legal range, explain the possible reasons of different finding.

DATA SHEET

Sample name:

Weight of empty petri:

Weight of sample:

Weight of empty petri and dried sample:

Weight of dried sample:

Submitted by:

Submitted to:

Group:

Group members: