
EXPERIMENT 13 DETERMINATION OF TOTAL ASH CONTENT IN FOOD PRODUCTS

Structure

- 13.0 Objectives
- 13.1 Introduction
- 13.2 Principle
- 13.3 Requirements
- 13.4 Procedure
- 13.5 Calculation
- 13.6 Result and Inference
- 13.7 Precautions

13.0 OBJECTIVES

After attending to this experiment, we shall be able to :

- learn to perform determination of total ash content in food products.

13.1 INTRODUCTION

Total ash refers to the inorganic residue remaining after total incineration of organic matter present in food. Because of its non-variable nature, the ash content can be used for assessing the quality of food product with respect to the presence of inorganic substance in it.

13.2 PRINCIPLE

Ash refers to the inorganic residue remaining after total incineration of organic matter. The ash content is determined from the loss of weight, which occurs from complete oxidation of sample at a high temperature 500 to 600°C through combustion and volatilization of organic materials.

13.3 REQUIREMENTS

Apparatus

Flat-Bottom Dish - of stainless steel, porcelain, silica or platinum.

Muffle Furnace maintained at $550 \pm 10^\circ\text{C}$.

Desiccator

13.4 PROCEDURE

Weigh accurately about 3 g of the material in the dish, previously dried in an air-oven and weighed. Heat the dish gently on a flame at first and then strongly in a muffle furnace at $550 \pm 10^\circ\text{C}$ till grey ash results. Cool the dish in a desiccator and weigh. Heat the dish again at $550 \pm 10^\circ\text{C}$ for 30 minutes. Cool the dish in a desiccator and weigh. Repeat this process of heating for 30 minutes, cooling and weighing until the difference between two successive weighing is less than 1 mg. Record the lowest weight.

13.5 CALCULATION

$$\text{Total ash, \% by mass} = \frac{100 \times (W_2 - W_1)}{W}$$

Where,

W_1 = weight, in g, of the empty crucible,

W_2 = weight, in g, of the crucible with ash, and

W = weight, in g, of the test sample.

13.6 RESULTS AND INFERENCE

The difference between the results of two concurrent determinations carried out simultaneously or in rapid succession by the same analyst (repeatability) shall not exceed 0.05% by mass.

13.7 PRECAUTIONS

- The temperature of ashing is varied from product to product.
- The use of higher temperature for ashing than the required temperature results low value of ash due to the loss of some inorganic matter like inorganic phosphate, sodium, etc.