

7.2 Determination of total ash

Principle

Principle involved is that when a known weight of feed is ignited to ash, the weight of ash thus obtained is expressed in terms of percentage.

Apparatus

- Silica crucible
- Tongs
- Weighing balance
- Electrical bunsen burner
- Muffle furnace
- Desiccator
- Asbestos sheet



Fig. 7.2 Muffle furnace

Procedure

1. Find out the weight of a clean dry crucible.
2. Place about 2 g of sample and weigh this to find out accurate weight of the sample taken.
3. Carefully place the weighed crucible over electric burner. The crucible should be partially opened.
4. The sample will get charred with initial expulsion of smoke.
5. Place the crucible in a muffle furnace (Fig. 7.2) and heat to 600°C. Keep it for 2 hours. At this temperature all organic matter will be burnt leaving behind minerals.
6. Remove the crucible from the furnace carefully and cool it in a desiccator to room temperature and weigh again.

Calculation

$$\begin{array}{l} \text{Ash content (\%)} \\ \text{Weight of empty crucible} \\ \text{Weight of crucible + sample} \\ \text{After complete ashing, Weight of crucible + ash} \end{array} \quad \begin{array}{l} = \\ - \\ - \\ - \end{array} \quad \begin{array}{l} (Z - X / Y - X) \times 100 \\ X \text{ g} \\ Y \text{ g} \\ Z \text{ g} \end{array}$$

What is obtained after complete combustion of a sample is total ash. It comprises of two portions: The portion that is soluble in dilute acids contains all essential minerals and that is the useful portion of the ash. Other portion, insoluble in dilute acids consists of mainly sand and silica. For the most part, it represents impurity or adulteration.

Reference: AOAC Official Method 942.05

