

## Estimation of ether extract using Soxhlet apparatus

### Principle

The crude fat present in the feed is extracted by petroleum ether using the soxhlet apparatus.

### Apparatus

- Spatula
- Weighing balance
- Thimble
- Heating mantle/hot plate.
- Soxhlet apparatus

### Reagent

- Petroleum ether

### Procedure

Set the soxhlet apparatus in position. Take thimble and find out its weight. Transfer about 5 g of sample into the thimble and find out the correct weight of the sample by weighing the thimble with the sample. Plug the mouth of the thimble with cotton wool, to avoid the escape of material from the thimble during extraction.

Slide the thimble with the contents into the soxhlet extractor. Fix the lower end of the soxhlet extractor to the flask underneath. Then fix the condenser above the soxhlet extractor. Take care to fix the ground surface suitable for easy removal after extraction. Adjust the water circulation for efficient and uniform cooling of the condensing unit.

The soxhlet apparatus is placed over an electrical heater/ hot plate (Fig. 7.7). From the top end of the apparatus pour about 100 ml of petroleum ether and plug the mouth with cotton. Run the extraction for 6 hours till the collecting ether in the extractor is clean.



Fig 7.7 Hot plate

Dismantle the apparatus on the completion of extraction. Remove the extractor with the flask from the condenser. Remove the thimble with its contents. Place it in the oven for drying. When dried find out the weight of the thimble with the extracted residue.

Remove the soxhlet flask with the extract. Transfer it to a hot air oven (80°C) for evaporating the petroleum ether. Weigh the flask with the dried residue.

### Calculation

You can find out the weight of ether extract either directly from weighing the flask with and without ether extract or indirectly by weighing the thimble with the substance before and after extraction. The loss of weight in this case will give the value for ether extract.

#### Direct

Weight of flask (empty)	= X g
Weight of flask + ether extract	= Y g
Weight of ether extract	= Y - X
g	
Percentage of ether extract	= $[(Y-X) / W] \times$
100 (W is the weight of sample taken)	

#### Indirect

Weight of thimble + feed sample before extraction	= X
g Weight of thimble after extraction	= Y
g Weight of the ether extract	= X - Y
Y g (Loss of weight represents the ether extract)	
Percentage of ether extract	= $\frac{X-Y}{W} \times$
100 (W is the weight of sample taken).	

**Precaution:** While placing the thimble-containing sample in the soxhlet flask, make sure that the top of the thimble is above the siphon tube. Put a cotton swab on the mouth of the condenser to avoid the loss of ether vapours.

**Reference:** AOAC official method 920.39, 16<sup>th</sup> Edition.