



Method 4.3 – Filter cake: moisture by oven drying

1. Rationale

This method is applicable to filter cake and determines the moisture in a sample gravimetrically.

2. Principle

The method uses oven drying at atmospheric pressure (130°C) followed by standardised conditions for cooling. The moisture is calculated based on the sample mass loss during drying.

3. Apparatus

- 3.1 **Top pan balance** readable to 0.01 g
- 3.2 **Moisture dish:** stainless steel with cover, 130 mm ϕ and 30 mm depth
- 3.3 **Desiccator** containing self-indicating silica gel
- 3.4 **Oven** operating at 130°C

4. Procedure

Heat the dish and cover for approximately 30 minutes in the oven at 130°C. Remove the dish and cover from the oven and allow to cool in a desiccator for approximately 1 hour before weighing accurately to 0.01 g. Add approximately 50 g of sample to the dish immediately replacing the cover and weigh the dish and contents again accurately to 0.01 g. Place the cover underneath the dish, transfer to the oven at 130°C and dry for 4 hours. Replace the cover and transfer the dish to a desiccator to cool to room temperature for 1 hour before re-weighing.

5. Calculations

The loss of mass is expressed as a percentage of the original mass of the sample.

$$\text{Moisture \% sugar} = \frac{(M_2 - M_3)}{(M_2 - M_1)} \times 100$$

where M_1	\equiv	mass of dish and cover (g)
M_2	\equiv	mass of dish, cover and sample before drying (g)
M_3	\equiv	mass of dish, cover and sample after drying (g)

Report as percentage to one decimal place.

6. Example

Mass of dish and lid	=	60.75 g
Mass of sample, dish and lid	=	110.75 g
Mass of sample before drying	=	50.00 g
Mass of sample, dish and lid after drying	=	71.65 g

$$\text{Moisture} = 39.10 \text{ g}$$

$$\text{Moisture \% sample} = \frac{39.10 \text{ g}}{50.00 \text{ g}} \times 100$$

$$= 78.20\%$$

Report as 78.2%

7. References

SASTA (1985). *Laboratory Manual for South African Sugar Factories*. 3rd Edition: 265 - 266.

SMRI (1997). Determination of the moisture in raw sugar by loss on drying. *SMRI Test Methods*, TM036.