Lab.(5) moisture content measurement

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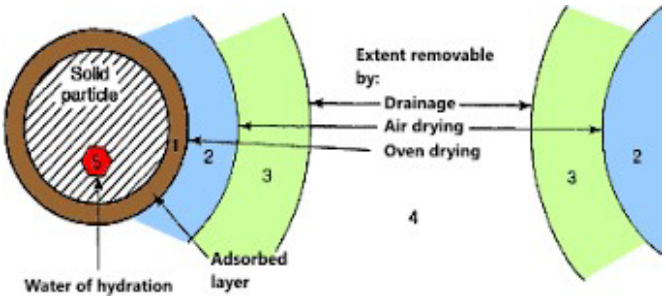

Content

- Forms of water in wet product
- Aim of determination moisture content
- Factors affecting moisture content of the product
- Method of determination of moisture content

Water forms in wet products

- Unbound water
- Bound water
- Water of crystallization

The aim of determination moisture content

- Assessment product quality
- Quality control and quality assurance of the product
- Assessment product stability
- Conformity of the process standards and statutory requirements
- Affect compactability and flow properties

Factors affecting moisture(water) content of the product

- Chemical composition of the constituents
- State of its constituents
- Nature of water content
- Temperature
- Humidity

Method of determination of moisture content

❖**Thermal drying method**

- hot air oven
- Vacuum oven

❖**Chemical assay**

- Using chemicals such as sulphur dioxide & iodine in presence of buffer

❖**Gravimetric or physical assay**

- By using desiccant materials such as silica gel

Thermal drying process

- Oven drying method is widely used.
- The loss of weight due to drying is considered as a measure of the moisture content of the sample
- The lost weight depends on what???

- When the drying process should be performed???
- What is the difference between moisture content of air and relative humidity???
- How can reduce relative humidity???
- Is the over drying is benefit or not???

procedure

- Dry the dish completely at 720W for 2 min. in microwave dryer.
- Weight the empty dried dish.
- Take 5 g of the sample and weigh into a dish which was previously dried in the microwave.
- Place the sample in the microwave at 180W and record the change in weight each 1 minutes.
- The heating and weighing procedures are repeated until successive weight does not differ by more than 10 milligrams for 3 successive readings.
- Loss in weights is recorded. Fill the next table

Wt of empty dish (mg)	
Wt of sample (mg)	
Initial wt of dish & sample	
Wt after 1 min. of drying	
Wt after 2 min. of drying	
Wt after 3min. Of drying	
Wt after 4 min. of drying	

- Total wt of the product = wt of water +wt of the dry material

- $\%\ \boldsymbol{moisture\ content\ = wt\ loss \div}$ ***wt of the dried sample ×100***

$$\%\ Loss\ of\ drying\ = \frac{Mass\ of\ water\ in\ sample\ (kg)}{Total\ mass\ of\ wet\ sample\ (kg)} \times\ 100$$

$$\%\ Moisture\ content\ = \frac{Mass\ of\ water\ in\ sample\ (kg)}{Mass\ of\ dry\ sample\ (kg)} \times\ 100$$