

Total Solids (Dry Matter Content) (Standard Method 2540C)

1. Application (analytes and matrices)

This method covers the measurement of total solids (dry matter) in plant tissue, soil and other materials.

2. Summary of Methods

Total solids are determined by drying a sample at 103-105°C.

3. Safety

All chemicals should be considered a potential health hazard. The laboratory is responsible for maintaining a current awareness file of OSHA regulations regarding the safe handling of the chemicals specified in this method. A reference file of material handling data sheets should be made available to all personnel involved in the chemical analysis.

4. Potential Interferences

4.1 Care must be taken to obtain a representative sample. Inadequate sample mixing is the main source of error.

5. Sample Collection, Preservation and Handling

- 5.1 Soil and plant samples are dried at 102-105°C,. The dried soil is then ground to pass a 12 mesh screen and plant tissue is ground to pass a 2 mm screen.
- 5.2 Water samples are stored at 4°C.

6. Equipment and Analytical instruments

- 6.1 Oven (force draft or circulating) capable of constant temperature of 102-105°C ±5°
- 6.2 Evaporating dishes (silica, porcelain or equivalent)
- 6.3 Scale 0.1 g or 0.01 g
- 6.4 Desiccator (gypsum or silica gel)

7. Consumable Supplies, Reagents and Standards

None

8. Procedure for Analysis

- 8.1 Thoroughly mix the entire sample prior to sub-sampling.
- 8.2 Record weight of evaporating dish to the nearest 0.1 g.
- 8.3 Place sub-sample in evaporating dish and record weight to the nearest 0.1 g.
- 8.4 Place evaporating dish with sub-sample in a force draft oven.
- 8.5 After 16 hours or when stable reading is obtained, remove evaporating dish and dry sample from oven. Place in desiccator to cool.
- 8.6.1 Record weight of evaporating dish and dry sample to nearest 0.1 g.

9. Calculations

- 9.1 Percent moisture content is measured as the weight lost during drying and is expressed as a percentage of the (as received) wet sample:

$$\% \text{ Moisture} = \frac{[(\text{weight wet sample} + \text{container}) - \text{weight dry sample} + \text{container}]}{(\text{weight wet sample} + \text{container}) - (\text{weight empty container})} \times 100$$

- 9.2 Percent dry matter is measured as the remaining weight of sample after drying and is expressed as percentage of the (as received) wet sample:

$$\% \text{ Dry Matter} = \frac{[(\text{weight dry sample} + \text{container}) - (\text{weight empty container})]}{(\text{weight wet sample} + \text{container}) - (\text{weight empty container})} \times 100$$

- 9.3 Dry Matter or moisture can be calculated from the other as the complement of 100% original content:

$$\% \text{ Dry Matter} = 100 - \% \text{ Moisture}$$

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10. Quality Control

- 10.1 One sample should be replicated every 10 or 1 replicate per small batch. Duplicate results should be within $\pm 10\%$ of real values to be accepted.

11. Data Reviewing and Reporting

Data are reviewed by the senior analyst for completeness and correctness before being sent out. Report results in percent Dry Matter.

12. References

- 12.1 Adapted from ASTM D2974 (1995)