84-045 LOSS on IGNITION

1. Application

1.1 The loss in weight resulting from igniting a soil in contact with air includes that due to combined water in soil colloids, to combustion of organic matter and to decomposition of carbonates. The temperature recommended for determining loss on ignition varies depending upon the information desired. Weight loss at 550°C is approximately equal to the amount of organic matter in the sample, although the result obtained is usually somewhat higher than that determined from the amount of carbon present. Weight loss resulting from ignition at 850°C includes structural water and carbonates as well as organic matter. The latter temperature may be used in procedures for total analysis of a soil sample.

2. Apparatus

2.1 Muffle furnace.

2.2 Porcelain or vycor crucibles

3. Reagents

3.1 None are required.

4. Procedure (at 550°C)

4.1 Weigh a suitable amount of sample ground to pass a 2 mm sieve into a tared porcelain or vycor crucible. Use less sample for organic soils.

4.2 Dry the sample overnight at 105°C and reweigh to determine the oven dry weight of the sample. Record this weight.

4.3 Place the crucible containing the oven dry sample in a muffle furnace. Heat slowly (increase temperature about 2°C/min.) to 550°C and continue heating at that temperature overnight.

4.4 Remove the crucible from the furnace, place it in a desiccator, cool, weigh and record weight.

NOTE: It has been determined that there is a loss of metals at temperatures higher than 550°C when compared to wet oxidation (perchloric acid) results. Organic matter is most effectively removed at 550°C.

5. Calculations

5.1 Loss on Ignition at 550°C =

$$\% = \frac{\text{Weight of O.D. sample - weight of sample after ignition}}{\text{weight of O.D. sample}} \times 100$$

6. Precision

6.1 Insufficient data available

7. References

7.1 Atkinson, H.J., Giles, G.R., MacLean, A.J. and Wright, J.R. 1958. Chemical methods of soil analysis. Contrib. No. 169 (Revised), Chem. Div., Sci. Serv., CDA, Ottawa.

7.2 Ball, D.F. 1964. Loss on ignition as an estimate of organic matter and organic carbon in non calcareous soils. J. Soil Sci. 15, 84-92.

7.3 McKeague, J.A. Ed. 1978. Manual on soil sampling and methods of analysis 2nd edition. Can. Soc. Soil Sci., Suite 907, 151, Slater St., Ottawa, Ont.