

Atomic Absorption Method Guide

Zn in Plant Materials

Key Words

- Plant Materials
- Zinc
- Flame
- Atomic Absorption

Principle

The sample is digested in mixed nitric/sulphuric/perchloric acids, and zinc is determined by flame atomic absorption spectrometry.

Reagents

Nitric acid (AnalaR grade, concentrated, s.g. 1.42)

Sulphuric acid (AnalaR grade, concentrated, s.g. 1.84)

Perchloric acid (AnalaR grade, concentrated, 72 %)

Zinc master standard (1000 mg/L, Spectrosol or equivalent)

Zinc sub-stock standard solution (10.0 mg/L)

Transfer 1.0 mL of zinc master standard solution to a 100.0 mL volumetric flask and dilute to volume with deionised water.

Working standards

Transfer 0, 5.0 and 10.0 mL of the zinc sub-stock standard solution into a series of 100 mL volumetric flasks containing 20 mL of deionised water. Add 1.0 mL of sulphuric acid to each flask and dilute to volume with deionised water. The working standards will contain 0, 0.5 and 1.0 mg/L of zinc.

Sample Preparation

Weigh 0.200 g of dry plant material into a 100 mL long necked Kjeldahl flask, add 1.0 mL of sulphuric acid, 5.0 mL of nitric acid and 1.0 mL of perchloric acid. Heat gently until the initial reaction subsides, then heat more strongly until white fumes of sulphuric acid appear. Continue to heat for 15 minutes, then cool and transfer to a 50.0 mL volumetric flask and dilute to volume with deionised water. The total digestion time will be 1-1.5 hours. 1.0 mg/L in solution is equivalent to 250 µg/g of zinc in the original sample.

Instrument Parameters

Figure 1: Instrument parameters

Results

Sample	Heather (1)	Heather (2)	Oak leaves	Peat
Zinc found (µg/g)	6.3	12.5	13.7	1.2
Reference value (µg/g)	6.7 - 7.5	11 - 12	11 - 13	2

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