Method Guide: 40147

Atomic Absorption Method Guide
Mn in Plant Materials

Key Words

- Plant Materials
- Manganese
- Flame
- Atomic Absorption

Principle

The sample is digested in mixed nitric/sulphuric/perchloric acids, and manganese 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 %)

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

Manganese sub-stock standard solution (100.0 mg/L)

Transfer 10.0 mL of manganese master standard solution to a 100.0 mL volumetric flask and dilute to volume with deionised water.

Working standards

Transfer 0, 2.5 and 5.0 mL of the manganese 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, 2.5 and 5.0 mg/L of manganese.

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. 5.0 mg/L in solution is equivalent to 0.125 % m/m of manganese in the original sample.

Instrument Parameters

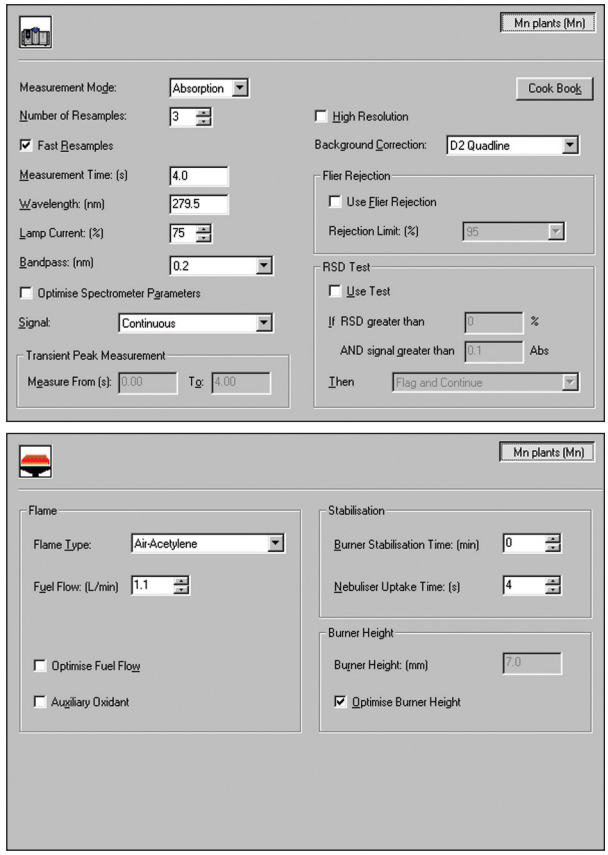

Figure 1: Instrument parameters

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Results

Sample	Heather (1)	Heather (2)	Oak leaves	Peat
Manganese found (%m/m)	0.069	0.041	0.041	<0.002
Reference value (%m/m)	0.067 - 0.074	0.037 - 0.039	0.039 - 0.041	<0.002 - 0.004

The method of sample treatment described in this publication should be performed only by a competent chemist or technician trained in the use of safe techniques in analytical chemistry. Users should acquaint themselves with particular hazards which may be incurred when toxic materials are being analysed and handled in the instruments, and the instrument must be used in accordance with the operating and safety instructions given in the Operators manual.

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