



Plant Tissue Digestion & Analysis

EQUIPMENT

1. Balance
2. Wiley Mill
3. CEM MARS 6 Microwave digester
4. Agilent 5800 ICP-OES

REAGENT

1. 76% HNO₃
2. Deionized water

PROCEDURE

1. Samples are placed in an oven to dry for ~18 h at 65°C.
2. Dried samples are ground in a Wiley mill and passed through a 20 mesh screen.
3. 0.500g samples are weighed out and placed in fluorocarbon polymer microwave vessels.
 - a. a QC standard is run with every batch
 - b. a blank and a duplicate is run with every batch
4. 10 mL concentrated HNO₃ is added to each vessel and then placed in the microwave digester and heated at 200°C for 30 minutes.
5. The digests are transferred quantitatively into volumetric flasks and brought to 100 mL volume with deionized water.
6. Digests are analyzed for P, K, S, Ca, Mg, Fe, Mn, Al, B, Cu, Zn, Ni, Na, Cd, Cr, Mo, Si.
7. All results are reported in percent or parts per million (mg kg⁻¹). Calibration standards are from a certified source. Independent laboratory performance checks are also run with acceptable deviations for recoveries set at 100 ± 5%.

REFERENCE

USEPA Method 3052, "Microwave assisted acid digestion of siliceous and organically based matrices," in Test Methods for Evaluating Solid Waste, US Environmental Protection Agency, Washington, DC, USA, 3rd edition, 1995.

J. T. Creed, C. A. Brockhoff, and T. D. Martin, "US-EPA Method 200.8: determination of trace elements in waters and wastes by inductively coupled plasma-mass spectrometry," in Environmental Monitoring Systems Laboratory Office of Research and Development, Revision 5.4 EMMC Version, U.S. Environmental Protection Agency, Cincinnati, Ohio, USA, 1994.