Soil Total Elemental Digestion & Analysis

EQUIPMENT

1. Balance
2. Hot Block
3. Agilent 5800 ICP-OES

REAGENT

1. 38% HNO_3
2. 30% H_2O_2
3. Deionized water

PROCEDURE

1. Soil is placed in a forced air oven (40°C) overnight, ground in a flail mill, and sieved through a 2-mm screen.
2. 1.00g samples are weighed into digestion tubes
    a. a QC standard is run with every batch
    b. a blank and a duplicate is run with every batch
3. 10 mL concentrated 38% HNO_3 is added to each vessel and then placed on the hot block and heated 120°C for 3 hours.
    a. Samples are inspected after 2 hours before being placed back on the hot block
    b. 5 ml of 38% HNO_3 are added to each sample
    c. 0.5 mL H_2O_2 are added to each sample
4. The digests are brought to a 50 mL volume with deionized water and filtered.
5. Digests are analyzed for P, K, S, Ca, Mg, Fe, Mn, Al, B, Cu, Zn, Ni, Na, Cd, Cr, Mo, Si.
6. All results are reported 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

U.S. EPA. 1996. “Method 3050B: Acid Digestion of Sediments, Sludges, and Soils,” Revision 2. Washington, DC.

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. Env. Protection Agency, Cincinnati, Ohio, USA, 1994.