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Protocol for Soil Extraction of Nitrate-N and Ammonium-N

Equipment

1) 100 ml Erlenmeyer flasks & clean rubber stoppers
2) Whatman #42 filter paper
3) Long-stemmed funnels and funnel rack
4) Mechanical shaker box
5) Polyethelyne scintillation vials with poly-lined caps

2M potassium chloride extraction solution

1) in 1000 ml volumetric flask, add
   150 g KCl
   800 ml deionized water (diH2O)
2) Add stir bar; place on stir plate and mix until dissolved.
3) Remove stir bar and bring to full 1000 ml volume with diH2O.
4) Cap with parafilm and invert several times to mix.

Procedure

1) Place 4 g wet-weight soil into each flask; add 20 ml extraction solution to each. Stopper flasks.
2) Place flasks in shaker box and shake 1 hour, medium speed.
3) Filter flask contents through funnels lined with filter paper; catch filtrate in labelled scintillation vials.
4) Cap vials and refrigerate until ready to analyze.
5) Analyze extracts by (Alpkem) continuous-flow colorimetry.

Post-analysis calculations

Calculate soil content from the extract's nitrate and ammonium values as determined by colorimetric analysis:

$$\text{ug analyte per g dry soil} = (\text{determined value, mg/L}) \times \frac{1000\ \text{ug}}{1\ \text{mg}} \times \frac{0.02\ \text{L}}{\text{soil dry weight (gm)}}$$

(The dry weight value of the soil sample is based on percent moisture data for each sample, obtained separately.)

Bibliography

Keeney, D. R. and D. W. Nelson. 1987.
Nitrogen--Inorganic Forms, sec. 33-3, extraction of exchangeable ammonium, nitrate, and nitrite. pp.648-9. In A. L. Page et al., eds., Methods of Soil Analysis: Part 2, Chemical and Microbiological Properties. Agronomy, A Series of Monographs, no.9 pt.2, Soil Science Society of America, Madison, Wisconsin USA.