

APPENDIX D-5
Preparation Procedure for Exchangeable K, Ca, and Mg:
Method ASA 9-3.1

Determination of Exchangeable Cations in Soils Without Determining Total CEC
Ammonium Acetate Extraction
ASA 9-3.1

Reagent:

1. 1N Ammonium Acetate - Dissolve 231.34 g of reagent grade ammonium acetate in 2 liters of deionized water. Make to a 3 liter volume. Place beaker on a stirrer, insert electrodes in the solution and adjust pH to 7.0 with concentrated ammonium hydroxide or glacial acetic acid. For an 18 liter volume dissolve 1388.04 g of ammonium acetate. (Other volumes may be made in the same ratio.)

Procedure:

1. Weigh 5 g of soil (-2 mm, which is -9 mesh) into 125 ml Erlenmeyer flask.
2. Add 50 ml of 1N ammonium acetate, shake for 30 minutes on oscillating shaker on low setting (180/min).
3. Let stand at least 6 hours, preferably overnight, occasionally swirling the flasks.
4. Filter through Whatman 40 filter paper into 50 ml Erlenmeyer flask.
5. Submit the filtrates for analysis by inductively coupled plasma (ICP) or atomic absorption.
6. Convert soil ppm to centimols (cmol) per kg (report to a hundredth of a cmol).

Examples:

Cation	Divide soil ppm by
Ca	400
Mg	242
K	391
Mn	549

References:

“Replacement of Exchangeable Cations, Ammonium Acetate Method” Section 9-3.1 in *Methods of Soil Analysis, Part 2, Chemical and Microbiological Properties*, Second Edition, A. L. Page Editor, American Society of Agronomy, Inc. 1982