

Chapter ATCP 40

APPENDIX B

HUMIC SUBSTANCE EXTRACTION TEST

The analytical method for determining the percentage content of a humic substance in a product shall follow a colorimetric test of a 0.5N NaOH extraction from the formulated product. The methodology is as follows:

Scope

This method may be used for solid and liquid samples containing 0.5% or more humic acid. The humic acids are dissolved by treatment with 1N sodium hydroxide and then precipitated with hydrochloric acid.

Equipment and Reagents

1. Centrifuge
2. 100 mL Screw Cap Centrifuge Bottles
3. 1 N NaOH
4. 1% NaOH (10 g/liter)
5. Conc. HCl
6. 100°C Drying Oven
7. Mechanical Shaker

Analysis

1. Weigh appropriate size sample into a 100 mL wide mouth screw top bottle to give close to 0.2 gms of dry humic acid ppt.
2. Add 50 mLs 1 N NaOH, seal tightly.
3. Shake on mechanical shaker for 1.5 hours for solids, 30 minutes for liquids.
4. Rinse the cap with 5 mLs 1% NaOH.

5. Centrifuge for 25 minutes at 2000 rpm.
6. Decant supernatant liquid into a second weighed bottle.
7. Add 10 mLs 1% NaOH to first bottle, shake vigorously, centrifuge again.
8. Add the supernatant liquid to the second centrifuge bottle.
9. To the combined extracts in the second bottle, add conc. HCl until the pH is adjusted to between 1 and 2.
10. Centrifuge the sample for 25 minutes at 2000 rpm.
11. Carefully decant the liquid and discard.
12. Add 25 mLs distilled water (previously adjusted to pH 1-2 with HCl) to the bottle with ppt., shake vigorously to free all ppt. from bottom and centrifuge again.
13. Again, carefully decant the liquid and discard.
14. Repeat steps 12 and 13 two more times.
15. Dry the bottle with humic acid overnight at 100° - 110° C.
16. Cool in dessicator and weigh.

Calculations

$$\% \text{ Humic Acid} = \frac{\text{Weight dried residue} \times 100}{\text{Sample weight}}$$

References

John Husler, University of New Mexico, Department of Geology, Albuquerque, New Mexico

C.A. Black, Methods of Soil Analysis Part 2, American Society of Agronomy, Inc., Madison, Wisconsin, 1965.