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| | FM-410 | |
| | FERTILIZER METHODS | Chapter |
| | | NITROGEN ANALYSIS |
| | | Subject |
| | Total Nitrogen – Combustion | |

SCOPE: This is an analytical procedure for the determination of total nitrogen in all fertilizer samples.

PRINCIPLE: Nitrogen is released from a fertilizer through combustion at high temperature utilizing ultra-high purity (99.99%) oxygen. The nitrogen is quantitatively measured by a thermal conductivity detector and converted to w/w percent nitrogen in the sample using the appropriate mechanism.

SAFETY: Each laboratory is responsible for maintaining a current file of the Occupational Safety and Health Administration (OSHA) regulations regarding the safe handling of the chemicals specified in this method. A reference file of Material Safety Data Sheets (MSDS) should be made available to all personnel involved in the chemical analysis. The preparation of a formal safety plan is also advisable.

**APPARATUS &
EQUIPMENT:**

- Perkin Elmer 2410 N analyzer - calibrated in accordance with Perkin Elmer 2410 manual
- Combustion tube - prepared as specified in Perkin Elmer 2410 manual
- Reduction tube - prepared as specified in Perkin Elmer 2410 manual
- Vial receptacle
- O – rings
- Forceps and/or tweezers

**REAGENTS &
CHEMICALS:**

- Aquasorb or drierite
- EA-1000-chromium & nickel oxide
- Copper oxide (wire form)
- Copper for nitrogen
- Sucrose NF grade or equivalent
- EDTA Analytical Standard grade
- Urea Electrophoresis grade or equivalent
- Quartz wool
- Silver gauze

STANDARDS:

1. Urea
2. EDTA
3. Sucrose

SAMPLE PREPARATION:

PROCEDURE:

1. Calibrate balance with 20g wt., as specified in Perkin Elmer 2410 manual.
2. Tare tin cup and weigh from 30-60 milligrams into cup.
3. Use forceps or tweezers to fold tin cup and then roll into ball shape.
4. Place rounded tin cup in correct position on auto sampler tray.
5. Write weight on sample sheet for transfer to PE computer.
6. Continue to next sample.
7. After all samples are weighed, enter weights into Perkin Elmer 2410 and start instrument as specified in Perkin Elmer 2410 manual.

SAMPLE ANALYSIS:

Optimize levels (1-4)


- 1=[oxyfil=1][comb=10][oxy boost=1][oxy boost=0]
- 2=[oxyfil=3][comb=20][oxy boost=2][oxy boost=0]
- 3=[oxyfil=6][comb=30][oxy boost=8][oxy boost=0]
- 4=[oxyfil=8][comb=30][oxy boost=10][oxy boost=0]

Note: Setting 2 is used for fertilizer samples. Setting 3 is used for all blanks and EDTA. Setting 4 is used for deficient samples that show a low bias when compared with the sum break-down nitrogen result.

CALCULATIONS:

See Section 9-5 of P.E. 2410 Manual.

APPROVAL:

Approved by:  Date: 1/29/03
Signature

Bureau Chief
Title

METHOD REVISION HISTORY:

| Version | Date | Description | Author |
|----------------|-------------|--------------------|---------------|
| Original | 01/29/03 | Replaces N-110 | W.M. Bell |
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REFERENCE:

Perkin Elmer 2410 Manual.