

# Nitrogen Determination in Fertilizers

LECO Corporation; Saint Joseph, Michigan USA

## Instrument: TruSpec® N

### Method Reference

AOAC 993.13

### Sampling and Sample Preparation

It is essential that a representative and uniform sample be analyzed. Solid samples should be ground to a uniform consistency. Refer to AOAC method 993.13 for additional information regarding sampling and sample preparation.

### Accessories

502-186 Tin Foil Cup, 502-040 Tin Capsule, 501-441 Sucrose.

### Calibration

NIST SRM 913 Uric Acid, NIST SRM 194 Ammonium Dihydrogen Phosphate, Reagent grade Ammonium Nitrate, or other suitable reference materials.

### Analysis Parameters

Combustion Furnace Temperature	950°C
Afterburner Temperature	850°C

### Element Parameters

Analyze	Nitrogen
Minimum Analysis Time	Yes
Comparator Level	30 seconds
Endline Time	1.00
Conversion Factor	1 second
Significant Digits	1.00
TC Baseline Delay Time	5
TC Baseline Time	5 seconds
	2 seconds

### Burn Profile

Burn Steps	Time	Furnace Flow
1	60 seconds	High

### Macro Ballast Parameters

Ballast	
Equilibrate Time	30 seconds
Not Filled Timeout	300 seconds

### Aliquot Loop

Fill Time	20 seconds
Equilibrate Pressure Time	4 seconds



### Procedure

1. Prepare instrument for operation as outlined in the operator's instruction manual.
2. Determine and calibrate system's blank as outlined in the operator's instruction manual.
3. Instrument must be calibrated as outlined in the operator's instruction manual.
4. Perform Drift Correction as outlined in the operator's instruction manual.

*Note: Drift should be performed at the start of every day or when the check standard doesn't return the correct result(s).*

5. Powder/granular samples.
  - a. Weigh ~0.05 gram sample into a 502-186 Tin Foil Cup; enter mass and sample identification into Sample Login (F3).
  - b. Add ~0.2 gram of 501-441 Sucrose and seal tin foil cup.
  - c. Place sealed tin foil cup into the appropriate position of the sample carousel and proceed with analysis.
6. Liquid (aqueous) samples.
  - a. Weigh ~0.1 gram sample into a 502-040 Tin Capsule; enter mass and sample identification into Sample Login (F3).
  - b. Add ~0.2 gram 501-441 Sucrose, do not seal capsule.
  - c. Place capsule into the appropriate position of the sample carousel and proceed with analysis.

## Typical Results

Sample	Mass g	Nitrogen %
NIST	0.0541	12.21
SRM 194	0.0516	12.11
@12.15% N	0.0505	12.19
	0.0500	12.10
	0.0522	12.12
<b>X =</b>	<b>12.15</b>	
<b>s =</b>	<b>0.050</b>	

Ammonium	0.0525	21.28
Sulfate	0.0508	21.24
@21.2% N	0.0509	21.25
	0.0513	21.34
	0.0507	21.32
<b>X=</b>	<b>21.29</b>	
<b>s =</b>	<b>0.043</b>	

Sample	Mass g	Nitrogen %
Ammonium	0.0507	34.40
Nitrate	0.0503	34.50
@35.0% N	0.0519	35.07
	0.0501	35.29
	0.0500	35.40
<b>X =</b>	<b>34.93</b>	
<b>s =</b>	<b>0.46</b>	

Liquid	0.1088	6.25
Fertilizer	0.1055	6.26
	0.1083	6.27
	0.1114	6.29
	0.1194	6.25
<b>X =</b>	<b>6.27</b>	
<b>s =</b>	<b>0.014</b>	

### LECO Corporation

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