AGRICULTURE
Focusing on **solutions** to meet **your** needs.

Timberline Instruments
1880 S. Flatiron Ct., Unit G
Boulder, CO 80301
800-777-5996
info@timberlineinstruments.com

EPA Approved Method

TL - 2800 Ammonia & Nitrate Analyzer

TIMBERLINE INSTRUMENTS

The Timberline Ammonia and Nitrate Analyzer is a laboratory instrument designed for high throughput automated analysis of ammonia and nitrate/nitrite in wastewater samples. **Total Kjeldahl Nitrogen** can be measured **without distillation.**

Our patented gas diffusion / conductivity principle provides results **unaffected by turbidity or color.** A **wide concentration range** is easily achieved with the standard diffusion membrane and conductivity cell.

Common Applications:

1. **Soil and Plant Tissue Extracts**
2. **Manure Extracts**
3. **Forage Extracts**
4. **Kjeldahl Digestates (No distillation step required!)**
5. **Water and Wastewater**

EPA Approved Method for Clean Water Act Applications - "Determination of Inorganic Ammonia by Continuous Flow Gas Diffusion and Conductivity Cell Analysis" Timberline Method Ammonia-001

Theory of Operation:

An 8-roller peristaltic pump directs sample, caustic, and absorbing solutions into a tubular diffusion membrane assembly. Within the assembly, sample is mixed with the caustic solution resulting in a mixture with a pH of 11 or higher. At this pH level, virtually all ammonium ions present in the sample are converted to dissolved ammonia gas.

As the sample & caustic mixture flows over the tubular membrane, dissolved ammonia gas diffuses through the membrane wall and is absorbed by a buffered solution at pH 6.5 flowing on the inside. The measured change in electrical conductance of the absorbing solution is proportional to the concentration of ammonium ion present in the sample.

Passing the sample/caustic mixture through an optional zinc reduction cartridge reduces nitrate and nitrite ions to ammonium ions, allowing measurement of the total inorganic nitrogen concentration.
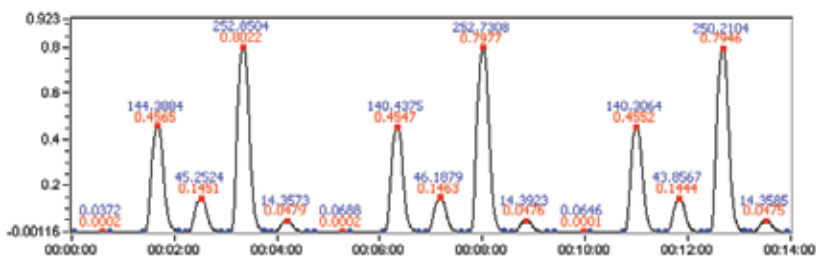
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Why choose Timberline?

Integral Membrane Separation & Conductivity Detection	Results are unaffected by turbidity or color of the sample. Significantly reduces interferences.
Low Maintenance	Samples are introduced via peristaltic pump with timed injection. The absence of sample injection valves reduces the need for filtration and prevents costly repairs and maintenance issues associated with premature valve failure.
High Sample Throughput	A 1.5-2.5 minute analysis time allows for rapid determination, reducing the total cost per sample.
Minimal Reagent Requirements Minimal Disposal Issues	Only three reagents are required for operation. ● Dilute Borate Buffer ● Dilute Sodium Hydroxide ● Deionized Water Activated zinc cartridges are used for nitrate analysis.
Integrated Data Acquisition Hardware	Data acquisition hardware runs with an onboard Microsoft® Windows 10 operating system, allowing for easy connection to networks, printers or external USB drives.
Intuitive Software	The Microsoft® Windows based data acquisition software provides complete automation of the instrument and sampling system, while the intuitive graphical user interface makes it very easy to learn and implement.
Wide Dynamic Range	Standard analyzer has a range of 0.05-500 ppm. High sensitivity options allow for even greater sensitivity.
Multiple Configurations	Two analyzer options and three autosampler options accommodate a range of sample loads. The single channel analyzer (TL-2800) automatically switches between ammonia and nitrate analysis while the dual channel analyzer (TL-2900) measures both simultaneously.

Analytical Specifications:

Analysis Time	One sample every 1.5-2.5 minutes
Dynamic Range	Standard Sensitivity - 50 ppb to 500 ppm High Sensitivity - 10 ppb to 10 ppm
Precision and Accuracy	(Ammonia) ± 5% of the amount present (Nitrate/Nitrite) ± 10% of the amount present
Calibration Frequency	Once per day