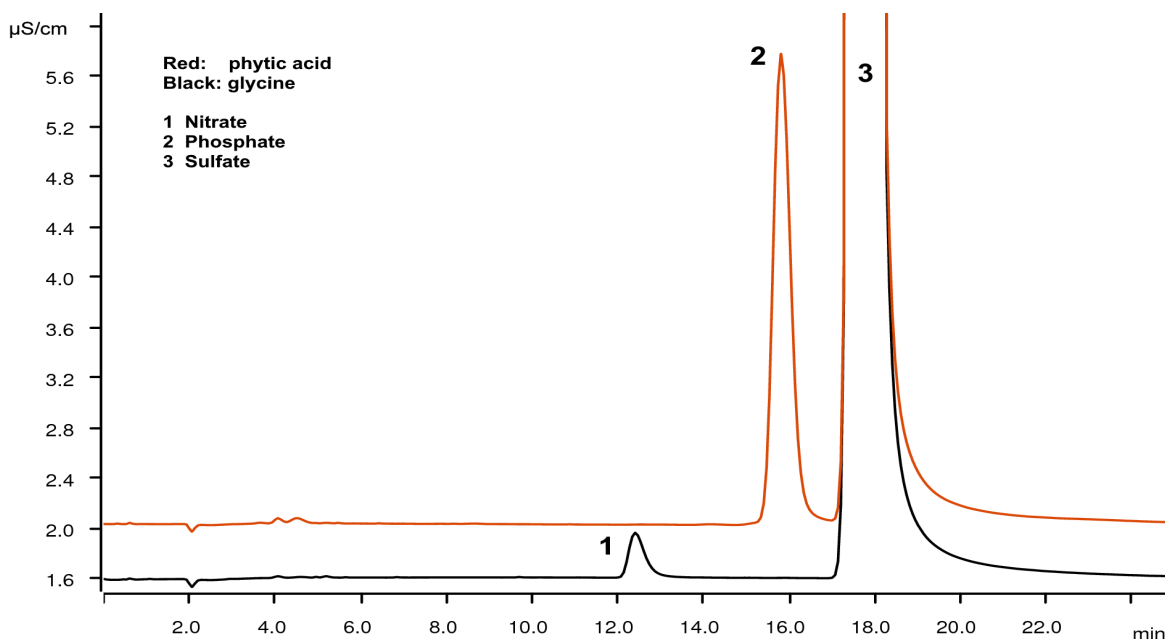


# Total Nitrogen, Total Kjeldahl Nitrogen, and Total Phosphorus as per ASTM D8001



Kjeldahl nitrogen is a typical titration application that follows digestion and ammonia distillation. The ASTM Standard D8001 now offers an alternative applying persulfate digestion followed by IC determination. No distillation is required. In addition, the method enables the determination of total nitrogen and total phosphorus. We show the results of control samples containing organic substances. As these substances are dissolved in ultrapure water, the nitrogen concentration found corresponds to Total Nitrogen and Kjeldahl Nitrogen.

## Results

Sample	Nitrate as nitrogen			Phosphate as phosphorus		
	expected [mg/L]	actual [mg/L]	recovery [%]	expected [mg/L]	actual [mg/L]	recovery [%]
NH <sub>4</sub> Cl	1.0	1.06	106	-	-	-
Glycine	2.5	2.63	105	-	-	-
Tripolyphosphate	-	-	-	10.0	9.10	91
Phytic acid	-	-	-	5.0	4.22	84*

\* Phytic acid recovery is improved when using slightly higher persulfate concentration

## Sample

Nitrogen and phosphorous containing compounds in ultrapure water

## Sample preparation

Alkaline persulfate digestion according to ASTM D8001 prior to Metrohm Inline Ultrafiltration and IC analysis.

## Columns

Metrosep A Supp 16 - 150/4.0	6.1031.420
Metrosep A Supp 16 Guard/4.0	6.1031.500

## Solutions

Eluent	5.5 mmol/L sodium carbonate 2.5 mmol/L sodium hydrogen carbonate
Suppressor regenerant	500 mmol/L sulfuric acid
Rinsing solution	STREAM

## Analysis

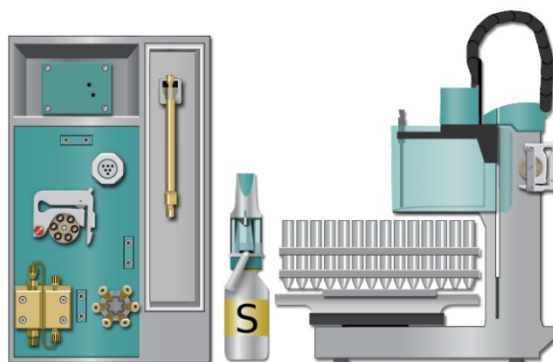
Conductivity detection after sequential suppression

## Instrumentation

930 Compact IC Flex Oven/SeS/PP/Deg	2.930.2560
IC Conductivity Detector	2.850.9010
858 Professional Sample Processor	2.858.0020
800 Dosino (suppression)	2.800.0010
IC equipment: Inline Ultrafiltration	6.5330.110
MSM Rotor A	6.2832.000
Adapter sleeve for Suppressor Vario	6.2842.020

## Parameters

Flow rate	0.8 mL/min
Injection volume	20 µL
P <sub>max</sub>	15 MPa
Recording time	42 min
Column temperature	45 °C



## Method detection limit (MDL)

Calculated from standard deviation of 7 injections

	Nitrate-N [µg/L]	Phosphate-P [µg/L]
MDL-1	14.9	17.2
MDL-2	13.5	14.6
MDL-3	15.6	14.6
MDL-4	14.4	16.9
MDL-5	14.5	18.0
MDL-6	13.2	15.6
MDL-7	15.8	16.2
Mean	14.6	16.4
Std. dev.	0.98	1.11
MDL (3.14 x SD)	3.1	3.5

Nitrate-N: nitrate as nitrogen

Phosphate: phosphate as phosphorus

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