The PRIMACS SNC-100 Total Carbon & Total Nitrogen Analyzer

The analysis of Carbon and Nitrogen is important in soil, plant, animal feed, food samples, sediments and sludge samples. The Skalar Primacs$^{SNC-100}$ analyzer provides fast and reliable analysis of Total Nitrogen (TN)/Protein, Total Organic Carbon (TOC), Total Elemental Carbon (TEC) and Total Inorganic Carbon (TIC) in solid and liquid samples.

The Primacs$^{SNC-100}$ combines the analysis of TC and TN in one unit. High temperature combustion with Non Dispersive Infrared detection (NDIR) is used for the analysis of TOC, TEC and TIC. The temperature settings are variable to get optimum combustion for different sample matrices and to allow the analysis of TEC. The determination of TN/Protein is based upon DUMAS methodology and detection with Thermal Conductivity (TCD). TIC can also be analyzed using automatic acidification and purging.

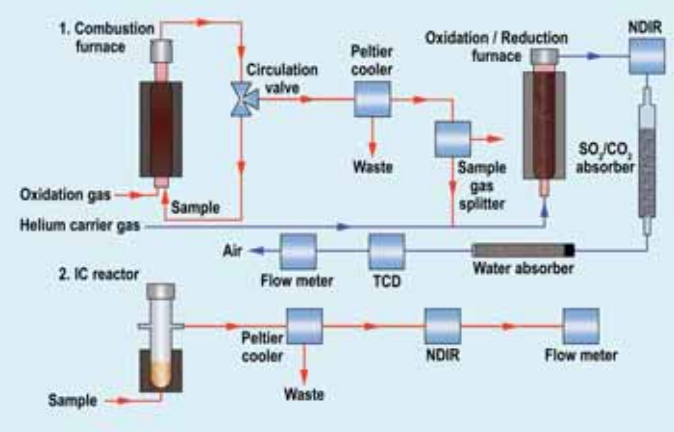
Operating Principle

Combustion

The samples are weighed in re-usable crucibles and placed in the autosampler. In the high temperature combustion furnace, at 1200°C, Carbon is completely oxidized to CO_2 and Nitrogen is converted into NxOy in the presence of oxygen. In the oxidation/reduction oven all Nitrogen is reduced to N_2. First CO_2 is measured by NDIR. Secondly the N_2 gas is measured by TCD.

Acidification

The samples are introduced in the IC reactor. Acid is automatically added to the reactor. IC is then released as CO_2 and measured by the NDIR detector.



Autosampler

The Primacs$^{SNC-100}$ contains a large integrated 100 positions autosampler with sample weights up to 3 g of solid material. Due to the unique vertical sample introduction, the sample ashes remain in the crucible after the analysis and are taken out of the instrument with removal of the crucible.

Quality Control

The analyzer uses various control systems to guarantee correct operation and accurate results such as:

- An internal active temperature stabilization system, which eliminates influences of room temperature

- An automated control system, which checks the gas flow and pressure on various places in the system

Software

The software displays the carbon and nitrogen peaks simultaneously in real-time and the results can easily be printed or exported to a LIMS system. Whenever priority samples have to be analyzed, the work list can be extended during the run.

The Primacs$^{SNC-100}$ complies with international regulations such as- CEN, ISO 10694, NEN-EN 131137, AOAC 990.03, AOAC 992.15, AACC 46-30 and ASBC.

General Characteristics

Analytes	Total Carbon - Total Nitrogen-Protein, TIC, TEC and TOC
Analysis Method	High temperature catalytic combustion, TN according to DUMAS method,
	TIC by Acidification,
	TIC-TEC-TOC by High temperature combustion with controlled temperature profile
Detection Method	TN-Protein by Thermal Conductivity Detection (TCD)
	Total Carbon,TIC, TEC and TOC by Non Dispersive Infrared Detection (NDIR)
Applications	Solid and liquid samples in - Food, soil, plant, milk, animal feed, etc.
	Soil (TIC, TEC, TOC by Combustion with temperature profile)
Auto sampler	Random Access, 100 positions, vertical sample introduction
Sample introduction	Unique vertical “bottom-to-top” sample introduction system
Features	Automatic balance interfacing
	Automatic leak test
	Back flush system to remove ambient air for accurate low level analysis
	Re-usable quartz crucibles
	Complies with international regulations such as ISO, EN, AOAC, ASBC etc.
Data processing	Area calculation (multi-point linear regression), interfaced balance, raw data storage
	and connection to LIMS.
Output:	I/O: Windows based SNCAccess software
Results output:	Computer screen, Harddrive, CD-Rom, USB-Drive, printer and ASCII files

Operational and Performance Characteristics

Measuring range	Carbon: 0.01 – 200 mg C Absolute, Nitrogen: 0.02-100 mg N absolute
Min. detection limit:	Nitrogen: 0.02 mg N absolute, Carbon: 0.01 mg C absolute
Analysis time	Approx. 3 - 5 minutes for TC/TN or TIC
Sample size	Solid samples: up to 3 gram (100-1000 mg nominal)
	Liquid samples: up to 1000 mg (µl) max.
Furnace Temperature	Combustion oven 1200° C
	2-Zone Oxidation/Reduction oven 750/600° C
	TIC reactor at 150°Celsius
Reproducibility	≤ 1 % RSD for Carbon
	≤ 0.5 % RSD for Nitrogen

Physical Characteristics

Gas	Carrier gas; Helium gas 99.99 % pure, at 300 kPa.
	Combustion gas; Oxygen gas 99.99 % pure, at 300 kPa.
Power requirements	220V – 240 V/50/60Hz.
Dimensions (hxdxw)	99 x 49 x 90 cm, approx.
Weight	120 kg, approx.

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Publication No. 0406012A. US