

ISO CHROM LC cube

The game changer in LC-IRMS



High data quality




Great flexibility



Ease of use



Extreme durability

ISO CHROM LC  cube

 **elementar**
EXCELLENCE IN ELEMENTS

ISO CHROM LC cube

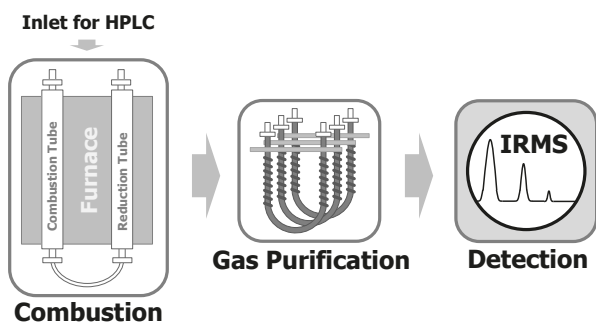
High Performance Isotope Analysis of LC separated compounds

KEY FEATURES

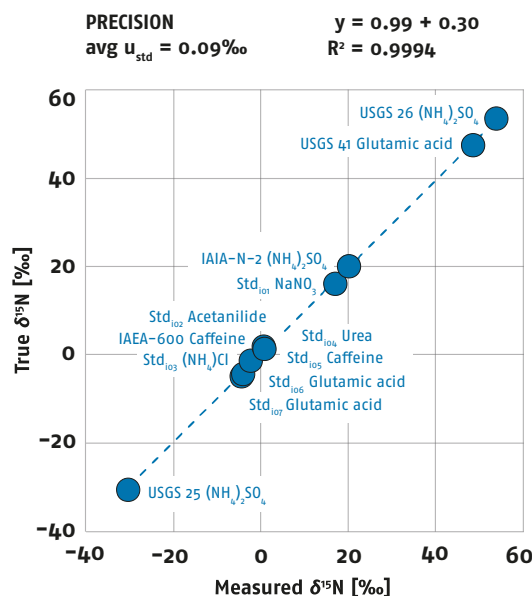
- Carbon and nitrogen isotope analysis possible
- Outstanding precision and accuracy
- Quantitative conversion
- No isotope fractionation
- Outstanding reliability and robustness
- Easy to use interface
- Can be connected to any HPLC system

Unlike the existing LC-inlet solution via chemical oxidation, the ISO CHROM LC cube works with high-temperature combustion. It quantitatively converts organic carbon to CO_2 and organic nitrogen to N_2 . Thus, for the first time, it is possible to alternatively perform stable nitrogen isotope analysis. In addition,

the easy-to-use ISO CHROM LC cube shows outstanding precision, accuracy, and linearity without significant peak broadening that can diminish the chromatographic performance. In continuous operation, virtually all peaks in a chromatogram can be analyzed for the stable isotope ratios of carbon or nitrogen.



Functional principle of ISO CHROM LC cube



Reliable performance

The ISO CHROM LC cube combines the proven Elementar high-temperature combustion technology with straight-forward combustion gas purification. This results in unrivaled low peak broadening that brings the chromatographic resolution of the HPLC system virtually unchanged to the mass spectrometer. This makes the ISO CHROM LC cube the first choice of any complex separation tasks in LC-IRMS.

No isotope fractionation

Thanks to the fast and complete conversion process of the high-temperature combustion, no isotope fractionation is observed. Period. This results in precise, high-quality data that can be trusted to represent the actual isotope ratios of a wide variety of samples.

Stable nitrogen isotope analysis

For the first time, it is possible to analyze stable nitrogen isotopes with LC-IRMS. In combination with stable carbon isotope analysis, this opens an entire new world of possibilities in studying non-volatile or thermolabile organic compounds that contain nitrogen, such as caffeine or amino acids. No derivatization prior to analysis is required.

Outstanding versatility

The ISO CHROM LC cube can be connected to any HPLC system to receive a sample liquid stream for conversion to CO₂ and N₂. Alternatively, direct injection of samples can be carried out as well to perform both bulk isotopic analysis and compound-specific analysis using the same system.

LC-IRMS



Liquid chromatography linked to IRMS (LC-IRMS) is a powerful analytical tool. The analysis of compounds does not need to undergo complex derivatizations as with the same sample run via GC-IRMS. The removal of any need for derivatization on these compounds means that back calculations do not need to be performed on the eventual $\delta^{13}\text{C}$ results. In many cases, samples need only be diluted with pure water, filtered, and then analyzed.

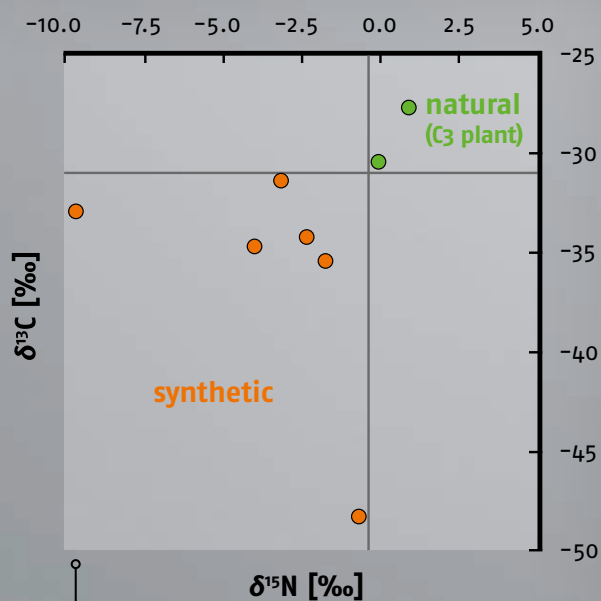
HIGH-TEMPERATURE COMBUSTION



High-temperature combustion principle relies on quantitatively converting the compound of interest into the gas phase at elevated temperatures in the presence of elemental oxygen. Carbon is oxidized to CO₂ and nitrogen to NO_x which is then subsequently reduced to N₂. Elementar's leading combustion technology ensures a reliable and quantitative conversion of compounds that are difficult to digest by chemical oxidation.

④ Outstanding $\delta^{15}\text{N}$ accuracy shown by direct injection analysis. No isotope fractionation affects the results.

LC-IRMS analysis has never been easier!



Authenticity of Caffeine measured by LC-IRMS (two-dimensional graph with $\delta^{13}\text{C}$ plotted versus $\delta^{15}\text{N}$ values).

PRECISION AND IONOS

To provide the best possible results, the ISO CHROM LC cube is connected to the **precisION**, the stable isotope ratio mass spectrometer with industry-leading gas ionization performance and mass resolution. Together with a seamless integration of hardware and software, it is at the forefront of modern stable isotope ratio mass spectrometry.

For data processing the **IONOS** is available, the most advanced software ever created for the stable isotope community. With the increasing demand on the modern-day laboratory for ever more efficiency, the overhead of processing and evaluating large data sets is an unwelcome requirement. **IONOS** removes these demands saving the analyst time and money while generating data more consistently.

IDEAL SOLUTION FOR

- Food analysis labs
- World anti-doping agency accredited labs
- Criminal forensic labs
- Academic research groups

SAMPLE TYPES ANALYZED

- Carbohydrates
- Amino acids
- Alcohols
- Organic acids
- Peptides
- APIs



High data quality

Outstanding precision and accuracy through high performance combustion, no isotope fractionation.



Great flexibility

Can be connected to any HPLC system, direct injection, stable carbon and nitrogen isotope analysis.



Ease of use

Easy, labor-saving instrument operation and sample preparation. Simplified maintenance.



Extreme durability

Outstanding robustness and longevity thanks to state-of-the-art technology. 10 year warranty on furnace.

Elementar – your partner for elemental analysis

Elementar is the world leader in high performance analysis of organic elements. Continuous innovation, creative solutions and comprehensive support form the foundation of the Elementar brand, ensuring our products continue to advance science across agriculture, chemical, environmental, energy, materials and forensics markets in more than 80 countries.

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