

# vario ISOTOPE cube

*Truly multi-elemental isotope ratio analysis*



Great flexibility



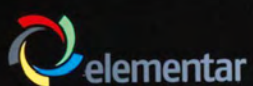
High data quality



Extreme durability



Ease of use



vario ISOTOPE  cube



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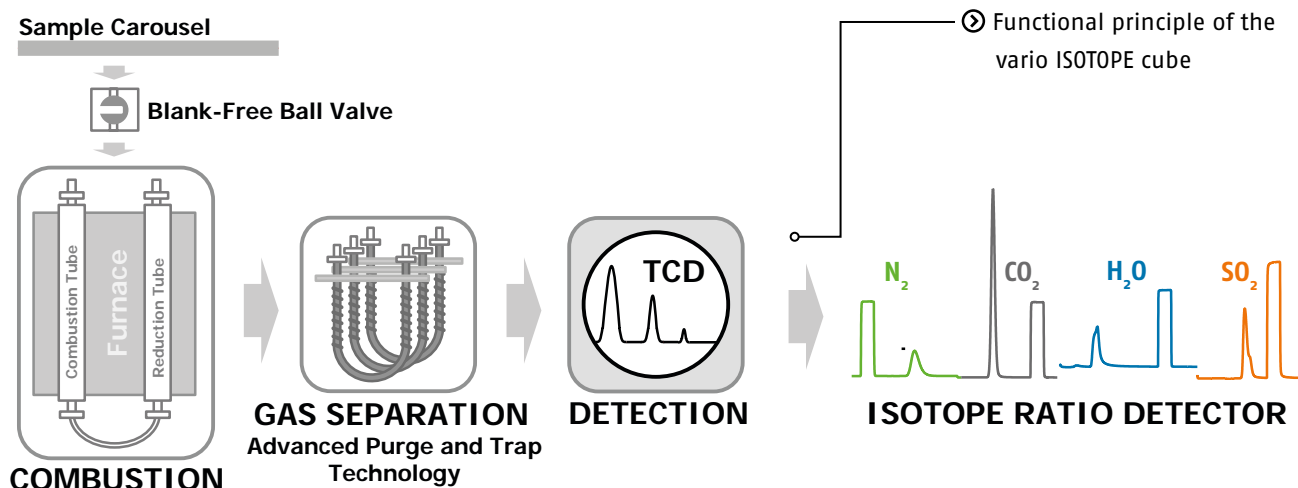
*Experience  
the gold standard*

## KEY FEATURES

- Market-leading accuracy and precision across a broad range of possible applications through Advanced Purge and Trap technology
- Superior ease of use through sophisticated self-diagnosis and tool-free routine maintenance
- Outstanding robustness
- 10-year guarantee on the high-temperature combustion furnace and the thermal conductivity detector cell of the thermal conductivity detector (TCD)
- Integrated 80 position autosampler as standard
- Patented ball valve for blank-free sample transfer

Market-leading accuracy and precision in EA-IRMS analysis combined with outstanding flexibility and superior ease of use – a matter of fact with vario ISOTOPE cube. The instrument can determine samples with even the most challenging C/N and C/S elemental ratios of up to 7000 : 1 and 5000 : 1, respectively.

This can be achieved thanks to the Advanced Purge and Trap technology provided exclusively by Elementar. Combine the vario ISOTOPE cube with one of our high performance IRMS systems and raise your isotope ratio analysis to the next level!



## Outstanding sample flexibility

The large dynamic range of the vario ISOTOPE cube allows measurement of samples in the low microgram as well as in the two-digit milligram range. The possible applications range from testing pure organic material (e. g. charcoal) to sediments with only trace amounts of organic material. Together with its outstanding precision, the vario ISOTOPE cube is a versatile and reliable solution for a wide range of sample types.

## Operating comfort

The vario ISOTOPE cube is optimized to significantly simplify daily routine operation. Clearly arranged, easily accessible system components as well as a furnace that slides out minimize maintenance efforts. The tool-free clamp connection system ensures a reliably leak-tight instrument at any time. Thus customers can enjoy smooth analyses and confidence in their results.

## One instrument for multiple tasks

Simultaneous CHNS isotope ratio analysis is available via an optional H<sub>2</sub> conversion kit. For a convenient measurement of liquid samples the vario ISOTOPE cube can be equipped with the vario liquid sampler (VLS) for injections directly into the combustion chamber. Hydrogen isotope ratios in water can be determined with an optional Chrome HD kit, providing far better than dual inlet precisions. All optionally available conversion kits allow upgrading the vario ISOTOPE cube at any time for special applications.

## Future-proof investment

Thanks to the outstanding robustness and longevity of our vario ISOTOPE cube, we grant a 10-year guarantee on the high-temperature combustion furnace and the thermal conductivity detector cell of the thermal conductivity detector (TCD9. With the confidence that you will receive the highest level of technical support from our experienced team, Elementar provides spare parts for a minimum of 10 years after the end of production. This results in outstanding low total cost of ownership and gives customers confidence in return of investment.

### HIGH-TEMPERATURE COMBUSTION



All elemental analyzers from Elementar are designed for minimal sample preparation and secure, unattended 24 / 7 operation. They use the safe, simple and environmental friendly high-temperature combustion principle. The proven Elementar furnace technology combined with efficient oxygen dosing guarantees quantitative conversion of the sample to measuring gas – a prerequisite for highly precise and matrix-independent elemental and isotope ratio analysis.

### ADVANCED PURGE AND TRAP (APT)



Elementar's proprietary APT technology is a unique high performance chromatographic technique for the determination of non-metal elements. The fractionation-free APT technology is capable of resolving e. g. C / N ratios of up to 7000 : 1 and C / S ratios of up to 5000 : 1. The distinct peak separation assures absolutely reliable and trouble-free data acquisition. The data analysis can therefore be easily automated for larger sample amounts while maintaining highest possible data quality. Elementar's unique APT columns are optimized to provide unmatched robustness and longevity compared to GC columns. Furthermore, they can be loaded up to 250-fold higher, resulting in outstanding sample flexibility. Thus, customers enjoy industry-leading accuracy, sensitivity and versatility.

# EA-IRMS analysis has never been easier!

SAMPLE*	$\delta^{13}\text{C}$ (‰ VPDB)	$\delta^{15}\text{N}$ (‰ AIR N <sub>2</sub> )	$\delta^{34}\text{S}$ (‰ VCDT)
COMMON REED LEAVES	$-28.16 \pm 0.04$	$4.05 \pm 0.01$	$-1.23 \pm 0.28$
FISH SCALE	$-18.65 \pm 0.03$	$10.23 \pm 0.05$	$8.83 \pm 0.28$
FISH MUSCLE	$-30.21 \pm 0.03$	$14.62 \pm 0.03$	$-0.38 \pm 0.04$
CASEINE	$-23.42 \pm 0.05$	$6.38 \pm 0.03$	$3.52 \pm 0.15$
WHEAT	$-26.71 \pm 0.03$	$12.54 \pm 0.10$	$-5.53 \pm 0.04$
TOMATO (ORGANIC)	–	$7.36 \pm 0.03$	–
TOMATO (CONVENTIONAL)	–	$-1.36 \pm 0.07$	–
OAK WOOD	$-27.01 \pm 0.01$	$1.07 \pm 0.04$	–
CAMBISOL A HORIZON	$-28.56 \pm 0.03$	$8.43 \pm 0.08$	$5.02 \pm 0.11$
PLEISTOCENIC FLUVIAL SEDIMENT	$-24.03 \pm 0.07$	$10.86 \pm 0.12$	–
VODKA**	$-34.31 \pm 0.02$	–	–
ELEMENTAL SULFUR	–	–	$17.15 \pm 0.65$

\*Sample weight between 5 – 100 mg, \*\*Liquid injection with VLS

## RELIABLE RESULTS

The vario ISOTOPE cube guarantees outstanding precision and accuracy through quantitative combustion via controlled oxygen jet-injection directly into the active zone. This leads to matrix-independent results even for samples which are difficult to combust. In combination with the state-of-the-art thermal conductivity detector, the instrument provides an elemental detection limit of < 100 ppm.

## QUALITY YOU CAN TRUST

Our consumables and spare parts are designed to meet the highest quality standards and reliability. They are certified and validated in accordance with international norms and standards. We do not compromise on quality of our parts and chemicals – this is the prerequisite of a guaranteed long lifetime of our instruments.

## IDEAL SOLUTION FOR

- Environmental laboratories
- Academic research groups
- Quality control laboratories
- Contract laboratories

## SAMPLE TYPES ANALYZED

- Chemicals
- Soil & sediment
- Plants
- Food & beverage
- Fuels



### Great flexibility

Wide range of optional conversion kits available for special applications. Upgradeable at any time.



### High data quality

Outstanding precision and accuracy through high performance combustion. Matrix-independent results. Longterm stability of calibration.



### Extreme durability

Outstanding robustness and longevity thanks to state-of-the-art technology. 10-year guarantee on the high-temperature combustion furnace and the thermal conductivity detector cell of the thermal conductivity detector (TCD).



### Ease of use

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

## Elementar – your partner for excellent elemental analysis

Elementar is the world leader in high performance analysis of organic and inorganic 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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