

ionOS

*The most advanced stable isotope software
ever created*

ionOS

*Fast and robust data processing
of the most complex samples*

ionOS® is 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 whilst generating data more consistently.

Designed completely from the ground up and uniquely for stable isotope analysis, ionOS provides exceptional automation and sophistication in your EA and GC data processing. ionOS delivers unparalleled gains for the entire stable isotope community.



Gain Time



With a vast array of powerful new features, ionOS can deliver considerable time savings to every stable isotope lab in the world. Stable isotope analysis commonly generates large data sets; whether handling data from multi-elemental (NCS) analysis or a complex GC separation of 100's of sample compounds. Processing these complex data sets is reduced to a small number of automatic functions, saving you large amounts of time and effort. Using Automatic Standard Compound Identification (Patent Pending), combined with the powerful Peak Mapping feature, multi-point isotopic calibration is instantly performed. The automatic Injection Grouping feature instantly groups similar injections giving automatic statistical analysis. With these simple tools, manual calculations are a thing of the past gaining you significant time.

**DOMINIQUE DUCLERC //
FLUIDS AND ORGANIC GEOCHEMISTRY LAB,
TOTAL S.A., FRANCE**

"We really enjoy working with ionOS. All the gas analysis we did in the beginning of 2015 (more than a thousand samples) were calculated and validated with ionOS! We have saved a lot of time. It is very useful for batches of a hundred samples and to check standards."

Gain Simplicity

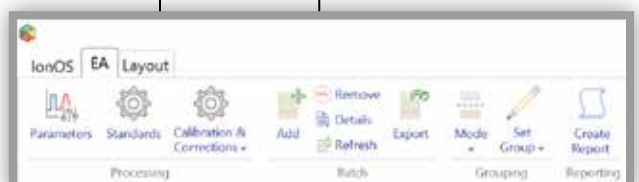
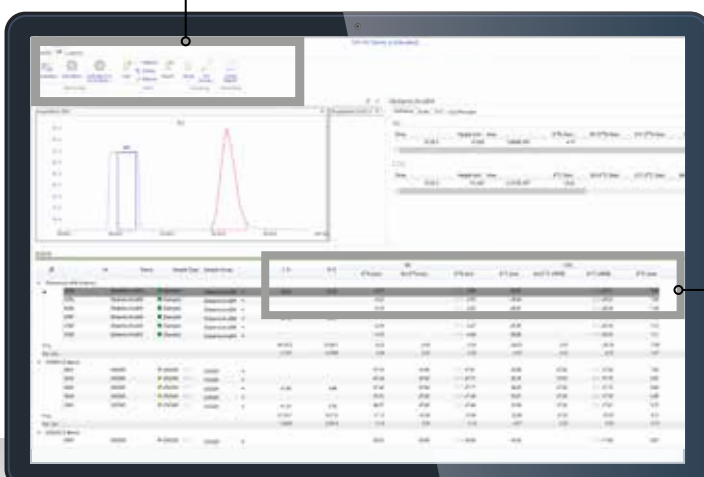
ionOS is simple to use. Creating something simple can only be achieved by understanding the fundamental requirements of the user. ionOS presents a clean user interface with clear iconography and structure. With collaborative input from our friends in the stable isotope community, you can be sure that the functionality you

want is available and intuitive. With powerful and intelligent automation built into every aspect of the data processing, calculations are performed transparently and robustly. Powerful search functionality gives you the ability to easily find your data, making it simpler than ever to manage your stable isotope data sets.

C %	N %	N2		CO2		
		$\delta^{15}\text{N}$ (Gas)	Std $\delta^{15}\text{N}$ (Air)	$\delta^{15}\text{N}$ (Air)	$\delta^{13}\text{C}$ (Gas)	Std $\delta^{13}\text{C}$ (VPDB)
46.93	10.75	-4.15		(C1) -3.88	-28.62	(C1) -28.51
48.06	11.18	-4.22		(C1) -3.95	-28.64	(C1) -28.52
46.25	10.81	-4.18		(C1) -3.91	-28.67	(C1) -28.55

② Find functions instantly with simple icons

② Transparent data calculations across all isotope species



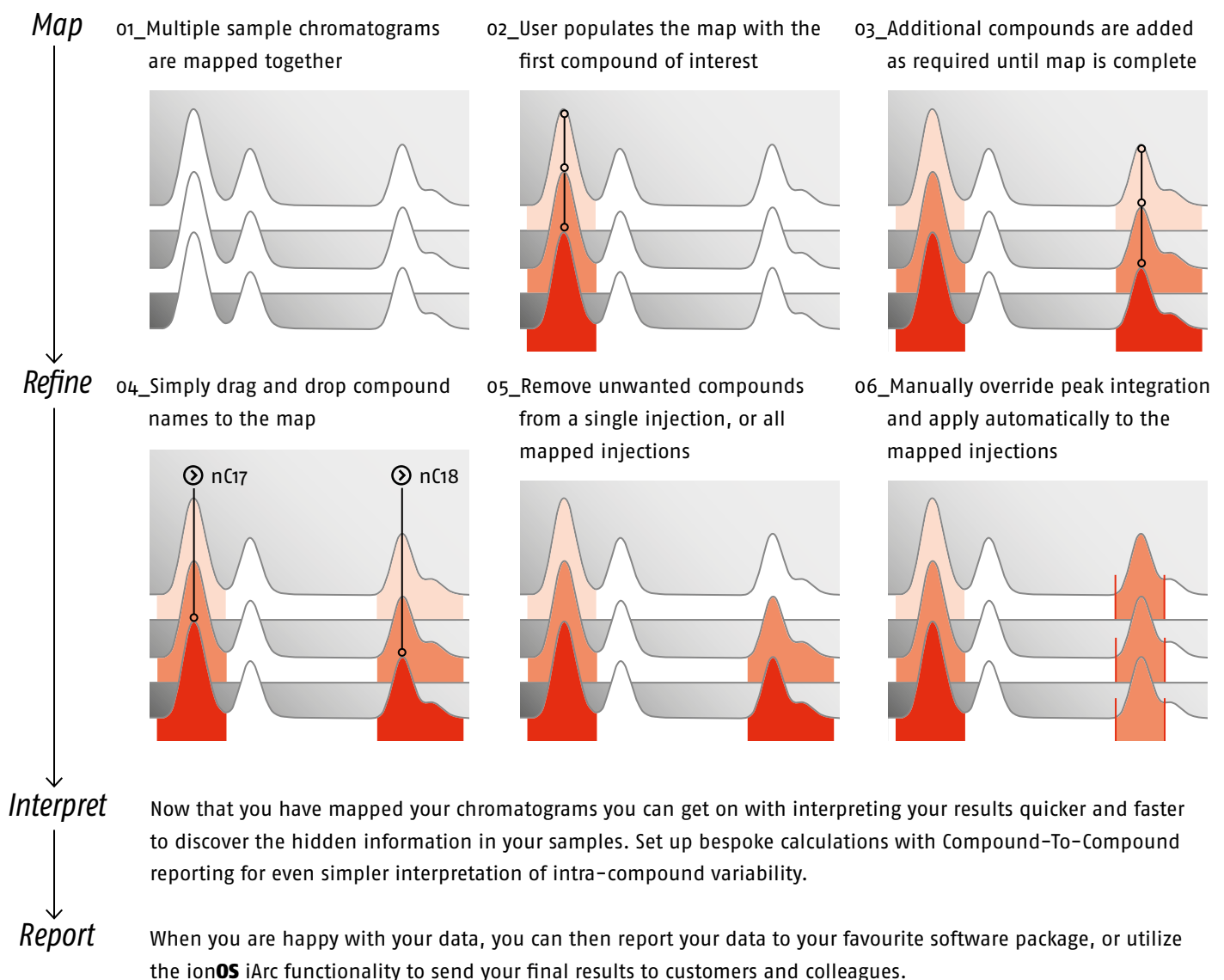
Gain Data Interpretation

GEO**MARK**

After working hard to collect, prepare and analyze your samples the complex task of data interpretation begins... **ionOS** goes further than any other stable isotope software to make your data interpretation easy. **ionOS** is the only stable isotope software to automatically provide multi-elemental, multi-point isotope calibration of raw data yielding results for immediate interpretation. Coupled with our unique Peak Maps feature, which instantly rationalizes GC compounds across multiple injections, you will have confidence in the validity of your data. Customizable Compound-to-Compound reporting provides innovative and detailed data interpretation. Use the Comparison View for side-by-side interpretation of chromatograms with synchronized peak refinement options available directly from the chromatogram so that your data interpretation is made simpler than before.

CRAIG BARRIE //
Oil Isotope Lab
GeoMark Research, Houston, USA

*"Our lab runs whole crude oils with hundreds of peaks, of which only a select number are of interest. Peak mapping makes selecting only those peaks across large data sets a quick and easy process, saving us a huge amount of time and effort. Even when there is a change in retention time **ionOS** can determine where the peaks of interest have shifted to."*



Gain Data Standardization

Standardization of stable isotope data is critical for the global stable isotope community to work together. As a company dedicated to stable isotope analysis, we believe that we have a duty to simplify this process and have put data standardization at the heart of **ionOS**.

ionOS lets you define a library of isotopic standards which can be used to perform automatic multi-point isotopic calibrations. This functionality allows you to generate consistent results, reported to pre-defined international reference scales. If required, the advanced calibration options allow experienced analysts to refine any applied calibration ensuring that all users report their findings in a standardized way.

DAVE HUGHES //
LANCASTER ENVIRONMENT CENTRE,
LANCASTER UNIVERSITY, UK

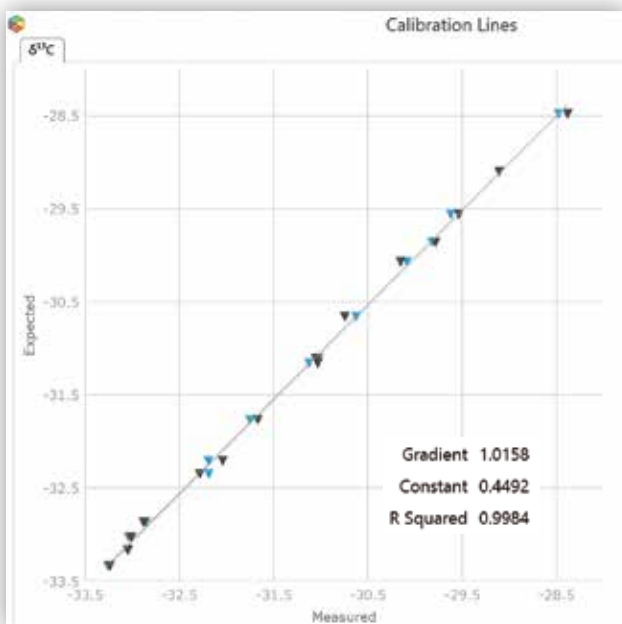
*"I'm VERY impressed by **ionOS**, especially the calibrations part. It's basically doing what I always wanted other software to do, but it never seemed to work or wasn't clear enough. This applies to a lot of chromatography quantifying packages I've used."*

The Importance of Multi-Point Isotope Calibration

The raw data output from a stable isotope analyzer is a dimensionless number with no context. In order to interpret the isotope ratio, it is essential that the analysis of your samples is performed within a framework of

multi-point isotope calibration*. For the first time, **ionOS** allows this multi-point calibration to be performed automatically, robustly and with traceability. This leads to establishing SOPs within the laboratory and for good calibration practice to be adopted universally across all users, without the need for a single user to develop in-house procedures with third-party software.

*<http://tinyurl.com/FIRMS-GuideIRMS>



Ⓞ Applied calibrations can be investigated directly from the batch results

AUTOMATIC STANDARD COMPOUND IDENTIFICATION

We have developed a unique (Patent Pending) algorithm which is able to automate the detection of isotope standards defined in your reference library. By fitting your results against the known standard values it is able to instantly recognize your isotope reference compounds. Because it works with your raw data the algorithm then leads to automatic calibration of your results in batch processing and provides you with real-time automatic identification of standard compounds during an acquisition.



Gain More

ionOS brings you more than any other stable isotope software and our customers agree, which is why we have made it available to the entire stable isotope community. Even if your data is generated using another manufacturer's instrument, you can still benefit from the power of ionOS. By powering your research with ionOS, you can be sure that you will have access to our exciting future innovations through automatic updates. With simple management of licenses through the ionOS web portal you are able to allocate licenses to students and collaborators so that they can work away from the lab and share data.

YOSHITO CHIKARAISHI //
Department of Biogeochemistry
JAMSTEC, Japan

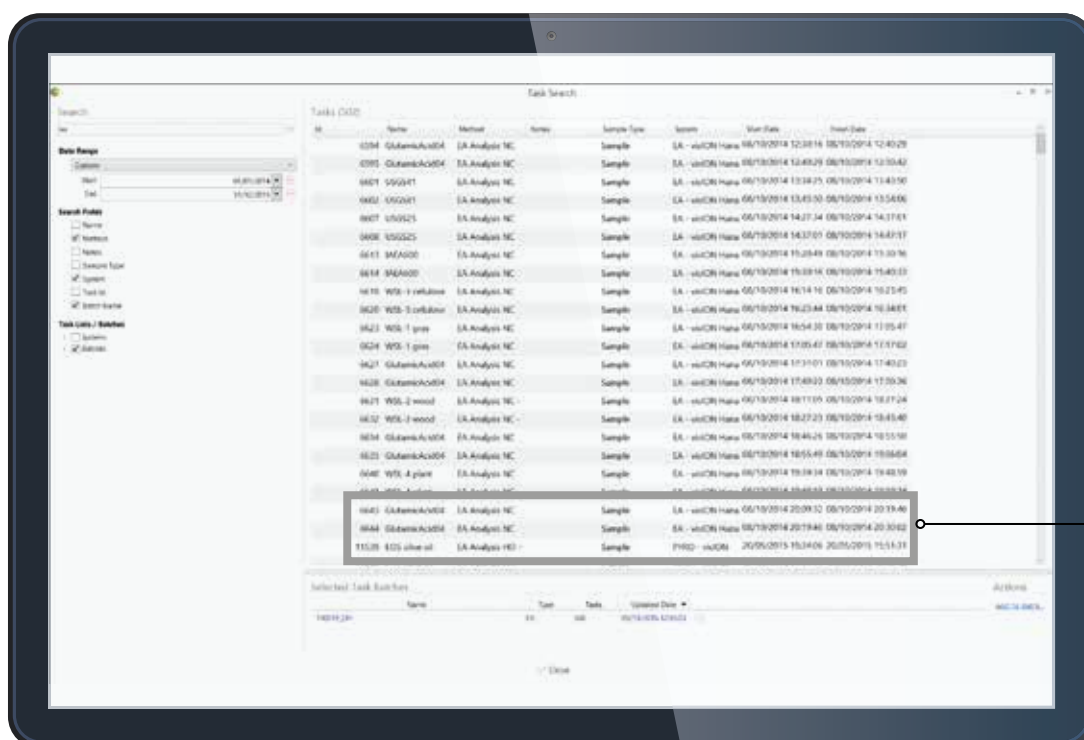
"Although I use a different IRMS instrument, I use ionOS for the processing of my GC isotope data. ionOS has sharply accelerated my work thanks to the great convenience, user-friendly interface and advanced functionality: thank you!"

I love ionOS and I also feel the huge potential of ionOS in the future, which will very much contribute to our isotope science community."

Gain Data Management

When handling large data sets, it is imperative that the data remains organized and easily searchable. ionOS makes this incredibly simple with the use of batches and its integrated search functionality. Samples can be added to batches at acquisition time or added retrospectively, giving a large degree of flexibility to how your data is managed. The rapid search functionality finds your data and instantly

sends it to one or more batches making it simpler to discover trends in your data. ionOS makes it easy to export your data and work anywhere by taking advantage of the iArc feature giving you the power to manage your data however you like. Powerful search functionality gives you the ability to easily find your data, making it simpler than ever to manage your stable isotope data sets.



➡ Use keyword search and instantly send tasks to multiple batches



ionOS KEY FEATURES

- Multi-point, multi-isotope calibration Wizard
- Drift Correction Wizard
- Blank Subtraction Wizard
- Advanced customization of calibration, drift correction and blank subtractions
- Result specific details and calibration overview
- Peak Maps for quick compound identification and peak refinements across repeat injections
- Automatic Standard Compound Identification quickly creates Peak Maps for known isotopic standards
- Bulk and Compound Specific isotopic standard definitions
- Reusable Peak Library allows for quick compound identification
- Quick drag & drop compound identification using the Peak Library
- Refine peak boundaries and apply to a Peak Map
- Transparent calculation workflows allow for complete traceability of results
- Automatically group injections to display average and standard deviation statistics
- ionOS Search allows you to compile long term data sets
- Inlet specific batch processing
- Comparison View allows you to work with multiple injections
- Real-time and fast data processing utilizing multi-core parallel-processing
- Report results to recognized international reference scales
- Customizable charts support zooming, panning and peak selection interactions
- Compound-To-Compound reporting with Calculated Columns
- Calculated Columns apply custom calculations to the batch
- Conditional formatting for Calculated Columns based on result thresholds
- Flexible and powerful peak detection and integration algorithms

IMPORT / EXPORT

- Use ionOS iArc files to archive, move and share data amongst colleagues and collaborators easier than ever
- Straightforwardly import your data from another manufacturer's stable isotope instrumentation
- IonVantage Import
- Use the **isoprime vision** and **precision** stable isotope instruments to easily acquire your data

DEVELOPMENT & SUPPORT

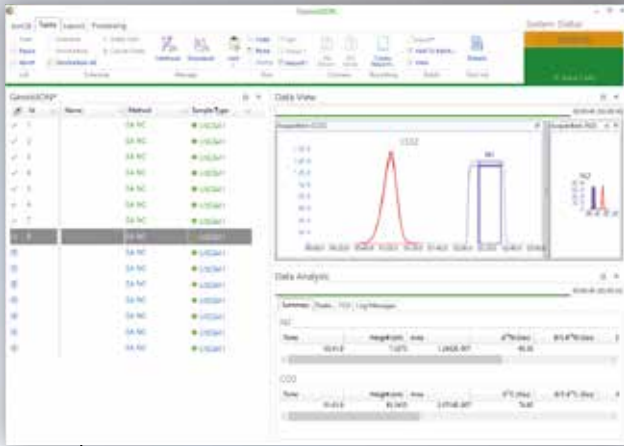
- Developed in full collaboration with the isotope community
- Online help desk for personal priority support
- Online remote support
- Community forum supported by Elementar
- Automatic software updates keep you up to date with the latest innovations
- On-line license management for assigning licenses to students and collaborators
- Comprehensive release notes available for any new major release or service release
- Designed for Windows 7, 8 and 10
- Clean and intuitive user interface
- Multi-language support

LICENSE TYPES

There are 3 ionOS data processing license types available for purchase. A single ionOS license enables its described features on a single PC. Get the next major release for free with any purchased licence. Up to 3 service releases to support a major product release.

- ionOS Data Processing License – Allows for full offline (not connected to an instrument) EA and GC data processing.
- ionOS IonVantage Import License – Allows for full offline (not connected to an instrument) EA and GC data processing and the import of IonVantage RAW data files.
- ionOS Third Party Import License – Allows for full offline (not connected to an instrument) EA and GC data processing and the import of supported third party data files: *.csv, *.dxf (Thermo)

ionOS is the power behind **isoprime visION** and **isoprime precisION** instruments



There is more to ionOS than purely data processing. ionOS also works in concert with the **isoprime visION** and **isoprime precisION** stable isotope instruments to provide an unrivaled level of intelligent control of the hardware. Since ionOS is designed completely from the ground up and uniquely for stable isotope analysis, it offers many powerful features designed to make the operators life incredibly simple.

Because ionOS extends through the entire stable isotope analysis workflow, the advantages of ionOS become very obvious, offering the stable isotope community a completely new experience in instrument control, acquisition, data analysis and interpretation.

Ⓢ Elemental Analysis

Conversion of bulk materials to sample gases prior to isotope analysis

Ⓢ Isotope Analysis

Intelligent analysis of sample gases from GC & EA inlets

Ⓢ Gas Chromatography

Separation of volatile organics and real time conversion to sample gases



Small footprint

Almost 50 % smaller than any other commercial stable isotope analyzer



Ease of use

Good-For-Go control allows one click instrument set-up



Advanced data analysis

The most powerful stable isotope data processing software ever created



Low cost of ownership

Instrument sleep / wake-up functions for reduced consumption of resources

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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