ThermoFisher SCIENTIFIC

Trace elemental analysis

Power through your complexity

Removing the challenges of complex sample analysis

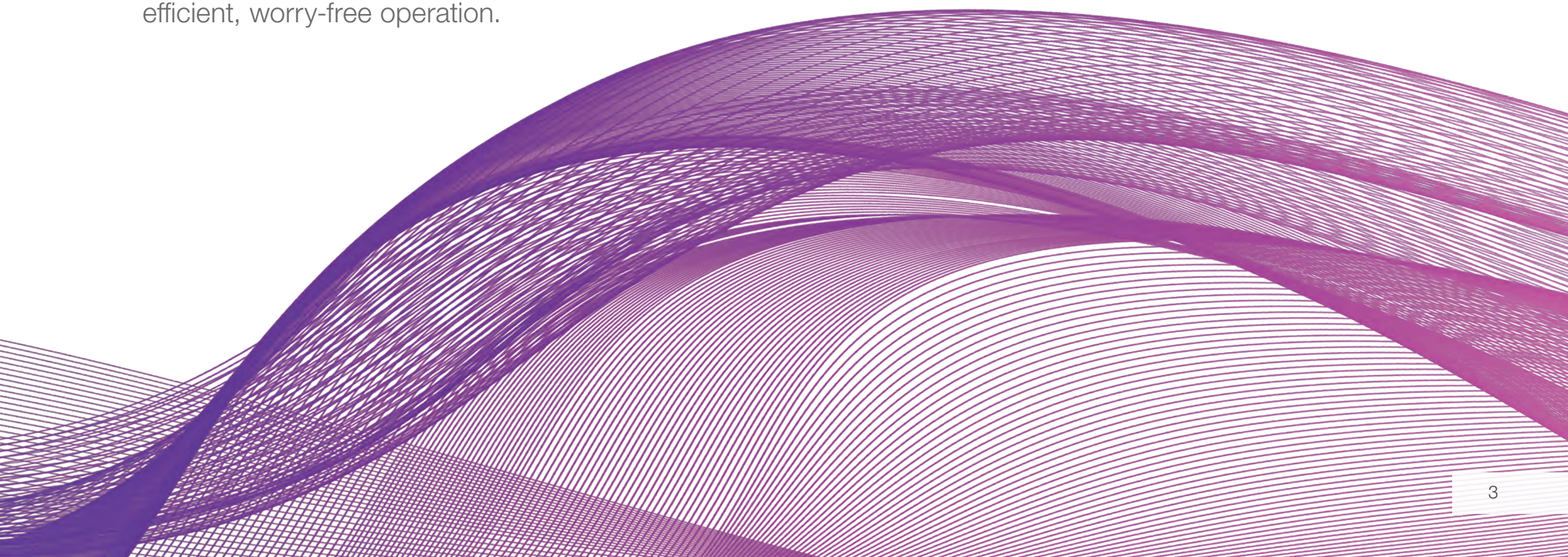
Thermo Scientific iCAP RQplus ICP-MS


thermoscientific
iCAP RQplus

Reliable, robust trace elemental analysis of complex samples

Laboratories that face the challenge of analyzing trace elements in complex and diverse matrix samples need a solution that delivers results quickly, with minimum maintenance and labor costs.

The Thermo Scientific™ iCAP™ RQplus ICP-MS provides the operational simplicity, robustness, and stability required to enable long-term daily analysis of varying matrices without drift, QC failures, or the need to re-run samples. Active monitoring of instrument performance and consumables takes the guesswork out of maintenance, and further assures reliable, efficient, worry-free operation.



Power through your complexity

Simplify your workflow

Flexible software with an intuitive interface is essential for high-throughput laboratories. Thermo Scientific™ Qtegra™ Intelligent Scientific Data Solution™ (ISDS) Software provides simplified user experience via clearly structured method creation and user-configurable templates, easily interpretable data display, and comprehensive results reporting.

Power through challenging samples

With three pre-set, next generation, self-optimizing online Argon Gas Dilution (AGD) modes, any sample type, starting from food digests and drug products, up to high matrix samples like soil digests and saline waters, can be measured immediately without prior manual dilution. Carryover and cross contamination is minimized by the intelligent design of the sample introduction system components. The resulting time savings is a game changer for the modern elemental laboratory running a wide variety of sample matrices.

Automate reliable performance

Validating instrument performance prior to analysis is vital for smooth daily operations. With the iCAP RQplus ICP-MS, the one-click Get Ready feature automatically checks performance and highlights any areas that need attention before analysis begins.

Comparing day-to-day performance over time helps track trends, pre-emptively identifies maintenance needs, avoids unplanned downtime, and aids audit preparation.

Petrochemical

Industrial

Clinical and toxicology

Food safety

Pharmaceutical

Environmental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Reducing complexity with iCAP RQplus ICP-MS technology

Robust sample handling that meets regulatory demands

Low, medium, and high argon gas dilution (AGD) modes with set dilution factor configurations easily handle every type of sample. Dependable and predictable performance is ensured through pre-defined automatic parameter optimization for each AGD mode, enabling you to achieve exceptional long-term analysis stability.

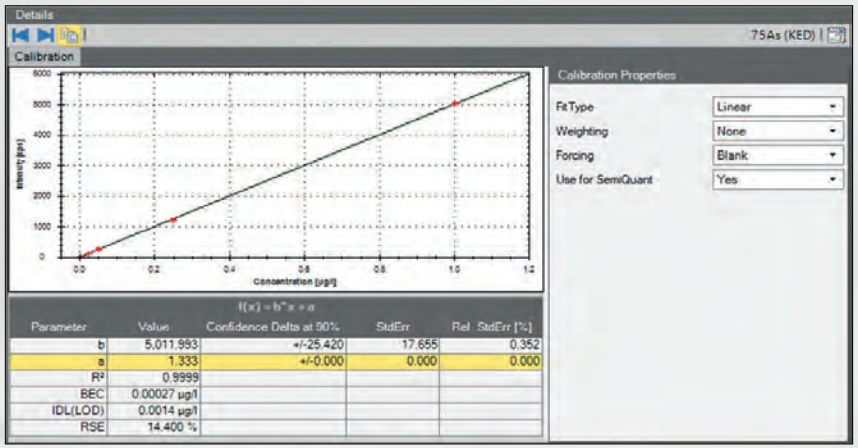

Figure 1. Arsenic Calibration Table with IDL

Efficiently managed uptime

Improve throughput by analyzing across the entire mass range in a single mode (Helium KED) without switching instrument conditions.

Automatic instrument monitoring with alerts keeps you running efficiently.

Quickly compare day-to-day instrument performance and track trends over time.

Maintain productivity and avoid unplanned downtime with Thermo Scientific™ Hawk™ consumables and maintenance assistant.

Advanced accessory handling and novel applications

Fully integrated Qtegra ISDS Software plug-ins provide straightforward operation of the new Thermo Scientific™ iSC-65 Autosampler and other industry-standard autosamplers, autodilution, and rapid sample introduction systems.

Perform speciation, material characterization, and novel emerging applications with fully compatible accessories for chromatography, laser ablation, or single cell analysis.

Figure 2. Dashboard - RQplus ICP-MS with iSC-65 Autosampler

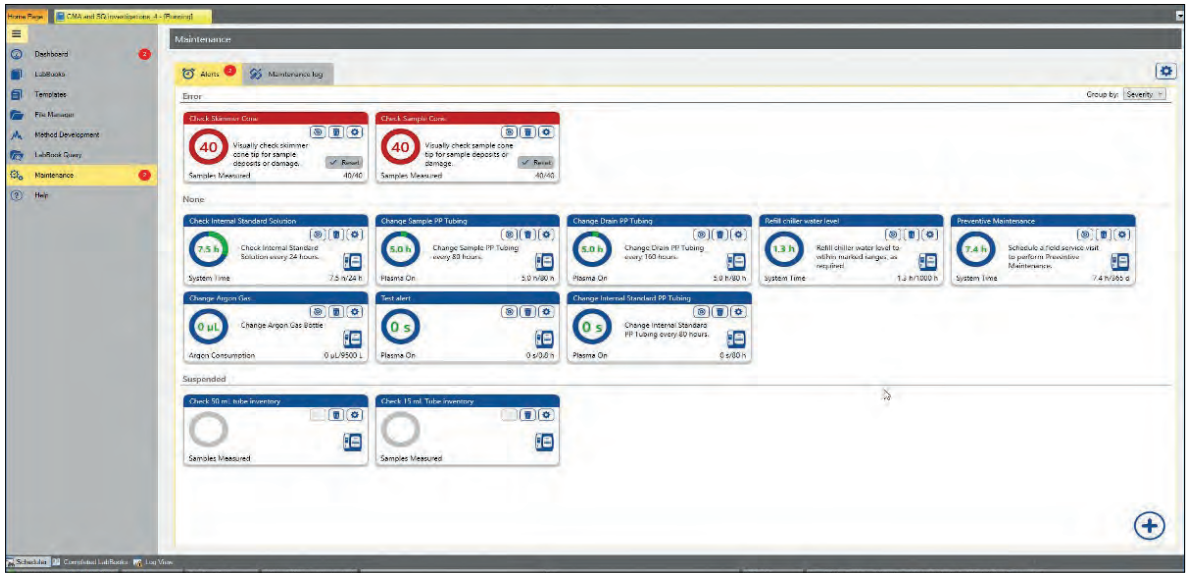

Figure 3. Hawk Consumables and Maintenance Assistant

Reducing complexity with iCAP RQplus ICP-MS technology

Simplified set up and operation, with accurate, right-first-time results

Having a correctly optimized ICP-MS is essential for ensuring performance that meets laboratory defined or external regulatory specifications. The iCAP RQplus ICP-MS is configured to support robust, reliable performance using simplified sample introduction hardware and system performance monitoring.

Key features and benefits

Quick, error-free sample introduction system with unique, automatically tensioned peristaltic pump. Take the guesswork out of pump tensioning and eliminate sample introduction variability.

Trouble-free operation using a quick-connect torch and injector, with automatically aligned gas connections.

Fast cone cleaning with easy-access interface door.

Maximum sensitivity and optimized polyatomic interference removal using QCell technology with helium cell gas and kinetic energy discrimination.

No user maintenance required downstream of the interface cones.

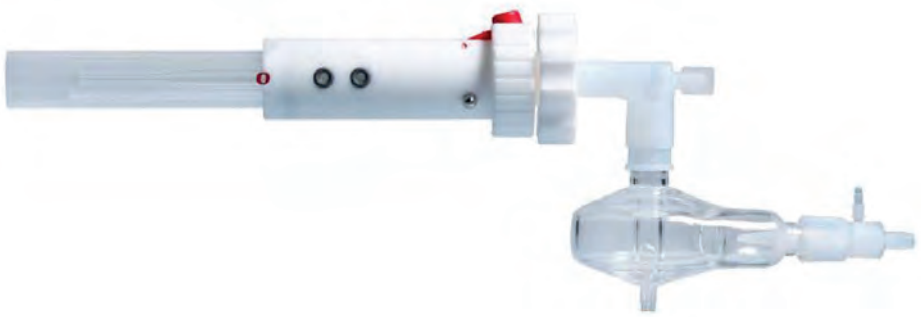

Figure 4. Quick-connect torch and injector

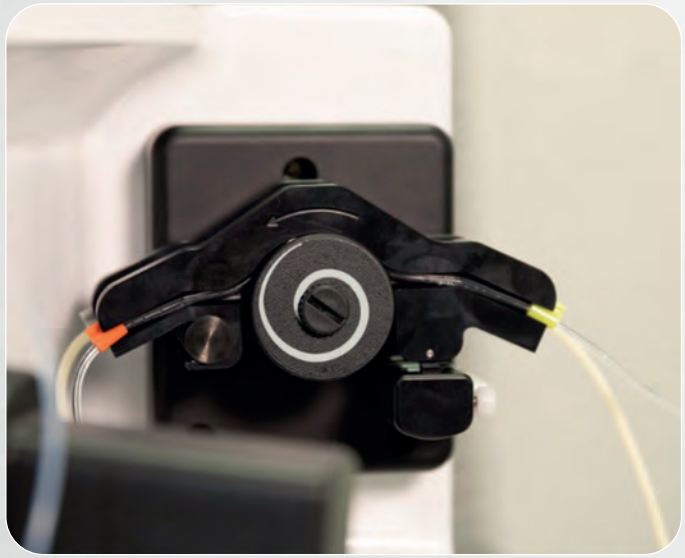

Figure 5. EasyClick Compact (ECC) Peristaltic Pump

Figure 6. Easy Access Interface Door

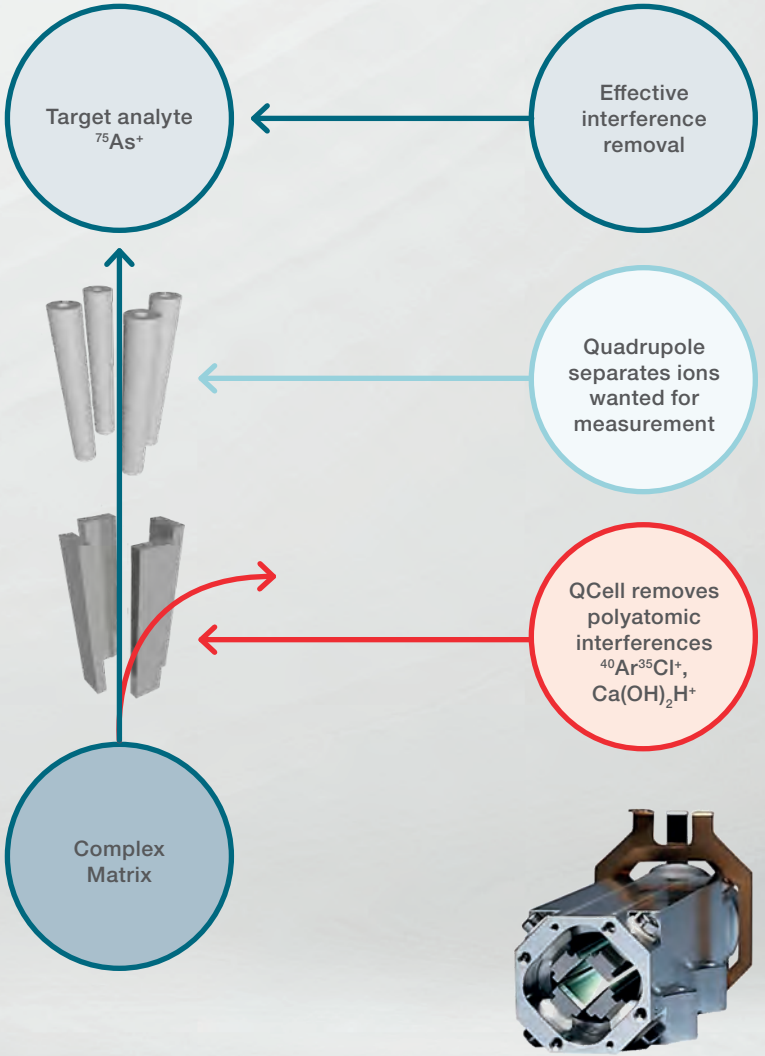

Figure 7. Advanced QCell interference removal technology

Qtegra Intelligent Scientific Data Solution (ISDS) Software

Workflow-structured software for optimized productivity

- Simple, intuitive, template-based workflow for easy implementation in your applied analytical laboratory.
- System DASHBOARD presents critical instrument status information in one clear view.
- Intelligent uptake and rinse functionality combined with unique Step Ahead technology optimizes throughput and eliminates carryover between samples.
- Fully integrated prescriptive and intelligent autodilution capabilities with industry leading accessories.
- Powerful options are available for laser ablation, chromatographic speciation, and single cell analysis.
- GET READY: fully automated, data driven startup process optimizes startup times and ensures consistent performance.

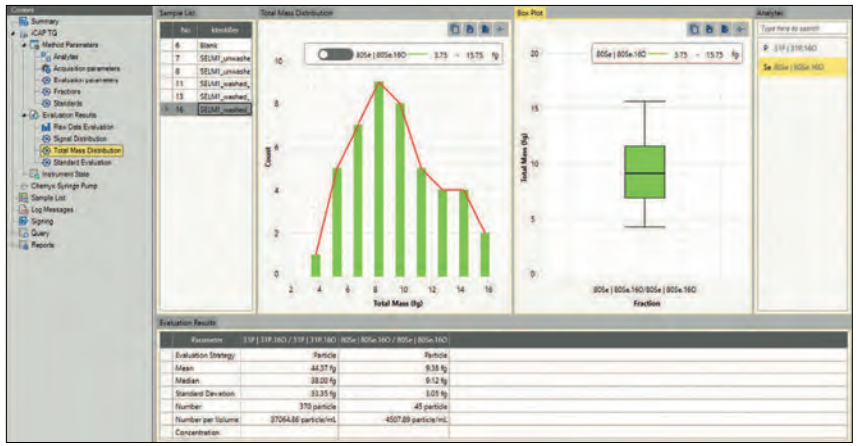

Figure 8. Single cell analysis with Qtegra ISDS Software

Intelligent data assessment

- Integrated, flexible QA/QC functionality ensures compliance with laboratory protocols such as ongoing calibration verifications, internal standard drift, and duplicate samples.
- User definable, analysis-specific limits and intuitive color-coding aid data visualization and highlight outlying data points, such as results higher than the calibration range.

Data and report management

Automated report generation and export features, including full LIMS compatibility, make data management effortless. Customize report formats to fit with the needs of the laboratory or your customers.

Compliance support

Compliance with regulatory requirements such as 21 CFR Part 11 is easily achieved within Qtegra ISDS Software via tools such as audit trailing, administrator / user access rights, and locked methods.

EPA, FDA, and ICH regulatory compliance and audit support

Data security and access control

Compliance management tools

Advanced reporting capability

The Qtegra ISDS Software platform is common across our ICP portfolio, which reduces training requirements and enables operators to switch easily between instruments.


DRIVEN BY OTEGRA ISDS
Concentration [ppt] (10^6)
0
5
10
15
20

Industries

With operational simplicity and reliable long-term performance at the core of the iCAP RQplus ICP-MS, a wide range of applications are accessible, covering multiple markets such as clinical research, pharmaceutical compliance, geosciences, petrochemical, and academic research.

Environmental

Measure both trace and major analytes in recurrent and challenging samples with confidence. Optimize productivity and accuracy for your elemental analysis using pre-defined AGD sample dilution modes and trusted He KED collision cell interference removal. With integrated QC checks, automatic self-assessment of the analysis performance with corrective actions can be easily implemented. Whether you are monitoring drinking water, wastewater, or soil digests, the high-throughput iCAP RQplus ICP-MS meets the demands of environmental analysis methods such as U.S. EPA 200.8, U.S. EPA 6020A, and the European ISO/DIN methods.

Food safety

Rapid and robust, simultaneous measurement of toxic and essential elements for food quality and safety confirmation is routinely achievable with the iCAP RQplus ICP-MS. A full set of integrated QC features ensures compliance with the requirements of food safety legislation and regulations. Extend your applied analytical laboratory capabilities by coupling ion chromatography (IC) or high-performance liquid chromatography (HPLC) with the iCAP RQplus ICP-MS to speciate critical elements such as chromium, arsenic, and mercury in food materials.

Industrial

Whether you are running low-level alloy QA/QC analysis or qualifying advanced materials in the battery, clean energy, and metallurgy industries, the iCAP RQplus ICP-MS can be easily configured to meet your analysis needs. Reliable and robust plasma generation enables you to obtain quality results from complex, variable matrix samples, including organic materials such as petroleum, kerosene, and organic solvents. With the QCell interference removal system, accurate and precise results are assured, even in complex matrix samples.

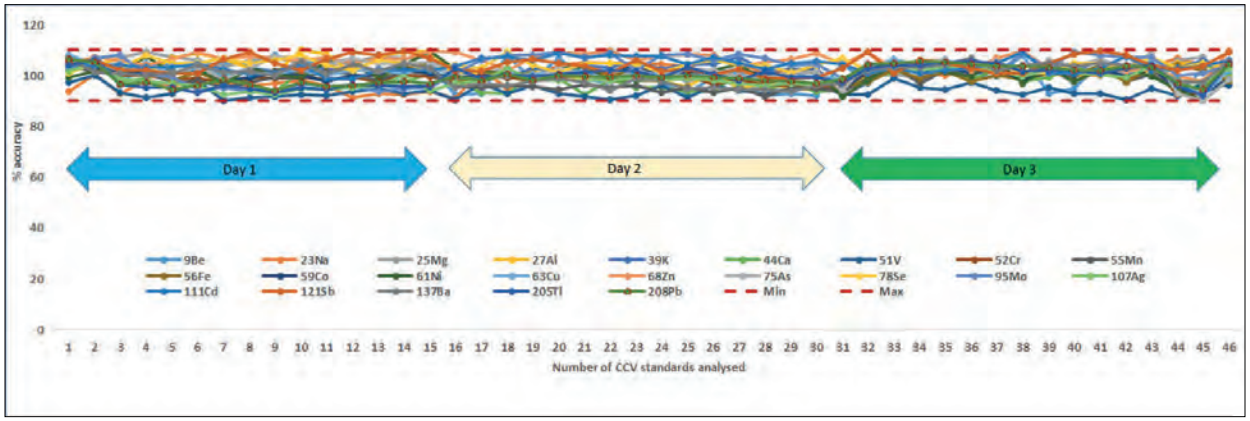

Figure 9. Percent accuracy of CCV standard analyzed over three consecutive days, EPA 6020B (SW-846)

Concentrations

	No	Date / Time	Sample Type	Label	52Cr (KED AGD)	55Mn (KED AGD)	56Fe (KED AGD)	59Co (KED AGD)	75As (KED AGD)	95Mo (KED AGD)	115In (KED AGD)
	1	9/9/2022 11:38:17 AM	BLK		-0.026	-0.494	-0.057	-0.001	0.187	-0.006	100.0%
	2	9/9/2022 11:41:48 AM	BLK		-0.019	-0.464	-0.030	-0.001	0.000	-0.011	100.0%
	3	9/9/2022 11:45:20 AM	BLK		-0.001	-0.255	0.132	0.001	0.041	-0.003	100.0%
	4	9/9/2022 11:48:53 AM	STD								
	12	9/9/2022 12:18:16 PM	QC - ICB	ICB	0.111	-0.469	3.184	0.119	0.571	23.447	91.6%
	13	9/9/2022 12:21:48 PM	QC - ICV	ICV	94.852 (105.2%)	95.718 (106.4%)	2,308.659 (102.6%)	93.462 (103.8%)	95.342 (105.9%)	79.203 (88.0%)	92.9%
	14	9/9/2022 12:25:21 PM	QC - CCB	CCB	0.024	-0.534	0.302	0.006	0.352	4.888	93.3%
	15	9/9/2022 12:28:53 PM	QC - CCV	CCV	95.212 (95.2%)	93.789 (93.8%)	2,407.564 (96.3%)	94.720 (94.7%)	94.003 (94.0%)	98.759 (98.8%)	93.1%
	16	9/9/2022 12:43:05 PM	QC - ICSA	ICSA	0.787 (=%)	-0.268 (=%)	98,938.880 (98.9%)	0.799 (=%)	0.284 (=%)	1,777.486 (88.9%)	90.6%
	17	9/9/2022 12:46:38 PM	QC - ICSAB	ICSAB	40.782 (102.0%)	29.701 (99.0%)	99,466.419 (99.5%)	20.795 (104.0%)	19.180 (95.9%)	1,800.804 (90.0%)	87.6%

Figure 10. Color coded sample results, 6020B

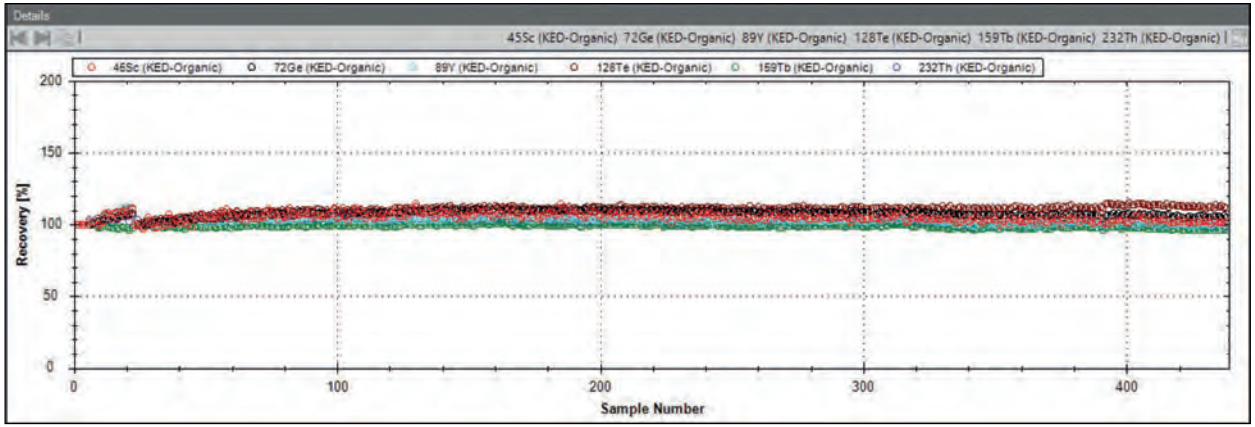

Figure 11. Signal stability of internal standards during the continuous analysis of acetonitrile over 28 hours

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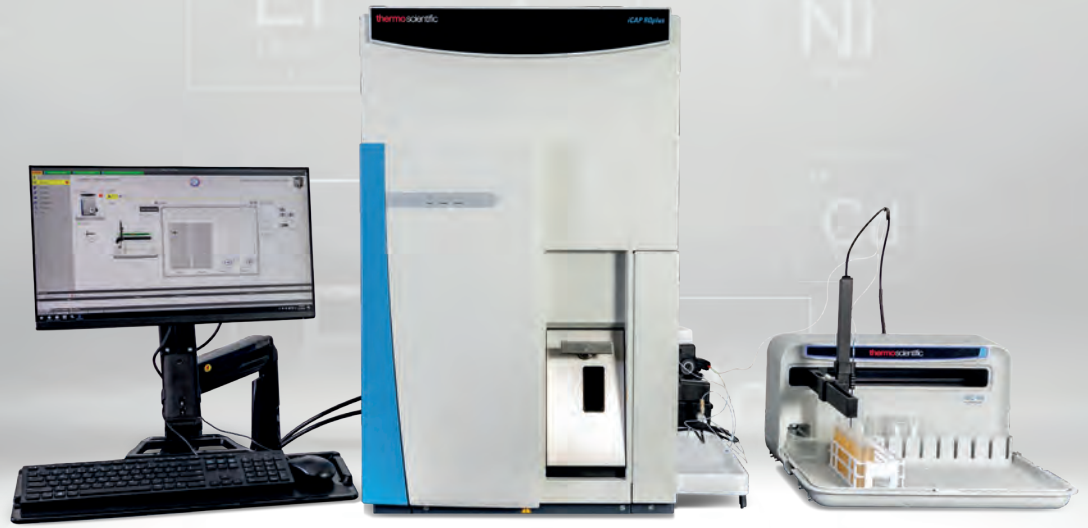
iCAP RQplus ICP-MS

For simple, robust, and accurate single quadrupole trace elemental analysis



Learn more at **thermofisher.com/ICP-MS**

ACT. The Environmental Impact Factor Label