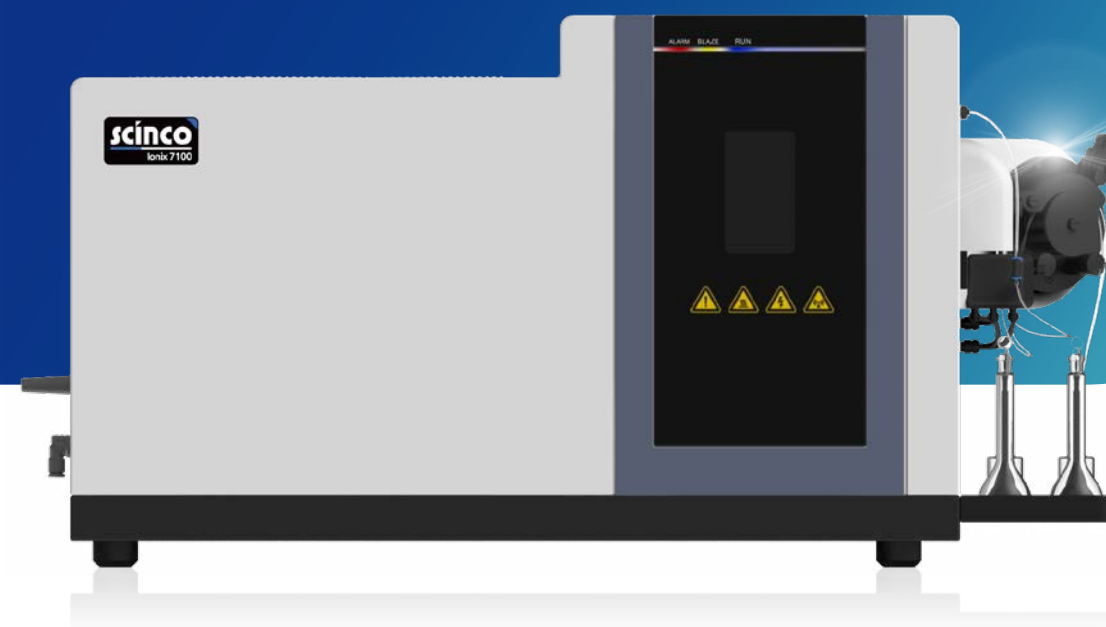




Ionix 7100

New Generation of Inorganic Mass Spectrometry

High Sensitivity and Exceptional Reliability
Inductively Coupled Plasma Mass Spectrometer



 www.scinco.com  scinco@scinco.com

SCINCO

627, Bongeunsa-ro, Gangnam-gu, Seoul 06083 KOREA Tel +82-2-2143-8200 Fax +82-2-2143-8355

R&D Center / Daejeon Office

746, Daedeok-daero, Yuseong-gu, Daejeon 34055 KOREA Tel +82-42-610-7400 Fax +82-42-610-7500

New Generation of ICP-MS with Continuous Innovation

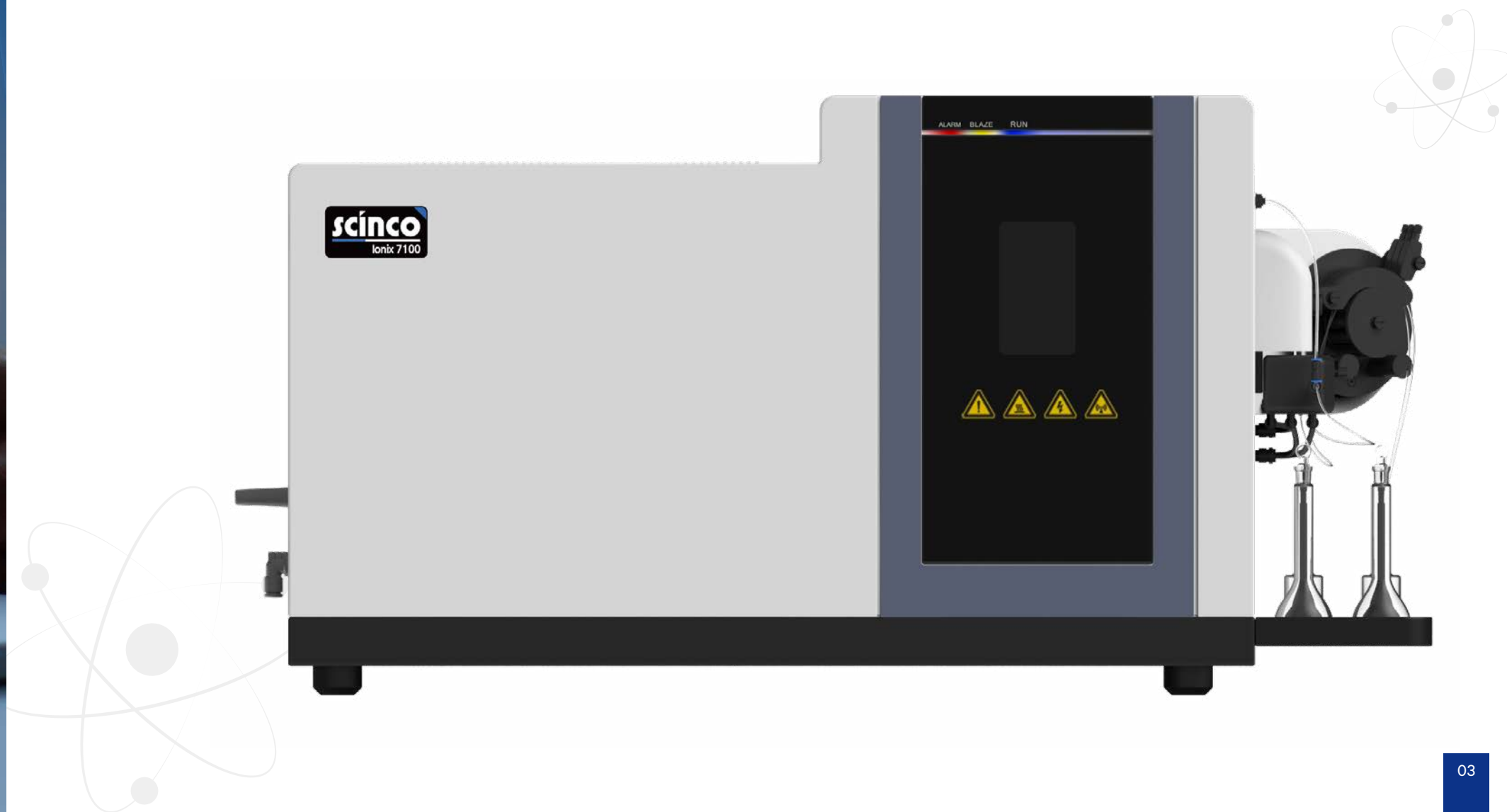


Inductively Coupled Plasma Mass Spectrometer

Ionix 7100 ICP-MS was developed after overcoming key technical challenges in mass spectrometry, including high-temperature gas-flow field control, a multi-stage gradient vacuum system, high-sensitivity ion interfaces, distributed collision/reaction cells, and a temperature- and humidity-resistant quadrupole mass analyzer.

The platform supports LC coupling, an on-line argon dilution system, automated rapid injection, oxy-combustion, laser ablation, atmospheric direct injection, and organic sample introduction, meeting the needs of a wide range of specialized applications.

IonixMaster software further simplifies operation through a standard method library, automatic tuning, guided workflows, and real-time visual status monitoring, significantly reducing the learning curve for routine laboratory use.



Ionix 7100

Typical Features

Through continuous product innovation, Ionix 7100 offers faster analysis, higher sensitivity, improved interference removal and specialized design features that simplify application workflows.



Excellent Sensitivity

①

On the basis of the aerodynamic simulation design at the junction of thermal plasma and vacuum, the ion interface is optimized, and the sensitivity of ICP-MS is increased by 3 to 5 times, with detection limits down to the ppt level. This makes it well suited for the detection of high-purity materials and reagents.

Excellent Matrix Tolerance

②

Ionix 7100 delivers excellent matrix tolerance, enabling direct introduction of high-salt samples up to 10%. This is achieved through fluid-dynamics-optimized ion interfaces, a dual off-axis design, collision/reaction cells, a powerful self-excited all-solid-state ICP ion source and online argon dilution.

Specialized ICP-MS to Solve Challenging Applications

③

- On-line monitoring system for heavy metals in surface water
- On-line monitoring system for heavy metals in atmospheric particles
- Heavy metal speciation analysis system based on LC-ICP-MS
- Solid direct injection ICP-MS solves difficulties in the analysis of solid refractory samples
- On-line monitoring system on hydrometallurgical processes
- On-line monitoring system for impurity metal elements in high-purity reagents for semiconductors
- On-line monitoring system for radionuclides at hazardous locations

Advanced Core System Technologies

The distributed collision/reaction gas diffusion mode improves the sensitivity, and greatly improves collision efficiency.

The ion kinetic energy discrimination technology is adopted, and combined with the advantages of the two modes of collision and dynamic reaction. The highly efficient collision mode directly dilutes blood samples for tests.

High-Speed Dynamic Collision Reaction Cell

5

Featuring a dual off-axis design, the system adopts composite electric-field multipole guiding technology and composite lens off-axis ion transport technology, significantly improving ion transport efficiency while eliminating interference from photons and neutral particles.

Composite Ion Transport System

4

The ions to be analyzed are highly efficiently transported to maintain the representativeness of analyte components. The ion interface is specially designed, and the sensitivity is greatly improved.

The handle-type taper switching interface is both stable and reliable as well as easy to operate.

Reliable Double Taper Interface Design

3

The self-excited all-solid-state radio frequency power supply adopts frequency-matching tuning, offering high tuning speed and enabling direct analysis of organic samples. With no moving parts, the system is stable and reliable.

A balanced drive reduces ion kinetic energy dispersion, eliminating the need for a shielding torch.

Stable ICP Ion Source

2

The torch features a split-body design, with a self-collimating assembly that is intuitive and simple to use. The TEC refrigerated atomization chamber is included in the standard configuration, which efficiently performs desolvatization, and improves the sensitivity and stability. The advanced on-line argon dilution system enables the direct injection of high-salt samples. Additionally, the independent oxygen injection system facilitates the reliable analysis of organic samples.

High-Efficiency Injection System

1

The pure molybdenum quadrupole offers ultra-high stability.

The RF power supply is resistant to changes in temperature and humidity, ensuring good stability under ordinary laboratory conditions. Frequency-modulated matching enables mass-axis calibration without manual tuning.

Quadrupole Mass Analyzer

6

Specialized digital/analog dual-mode detector with a dynamic range of 9 to 10 orders of magnitude

High-Sensitivity Electron Multiplier

7



01 High-Efficiency Injection System



Split-body torch

Full split-body torch design, self-collimation installation, and simplified torch design greatly reduce the operating costs of the torch. Only the central tube needs to be replaced for different applications to meet their different injection requirements such as organic, high salt, high sensitivity, HF acid resistance, and more.



Full MFC gas control system

The system features a highly integrated, high-precision digital MFC gas circuit controller with a control accuracy better than 0.5%. Up to seven MFC channels can be configured. In addition to atomizing, auxiliary, and cooling gases, the system supports additional dilution gases, auxiliary oxygen, and two-way collision gases.



TEC refrigerated injection included in standard configuration

The injection system features a standard TEC refrigeration module, which ensures consistent stability during extended runs and optimizes the analysis of organic solvents by suppressing oxide levels.



Online argon dilution system (AGOD)

The system supports high-salt matrices and offers both high-salt-resistant introduction and on-line dilution modes. A secondary argon flow dilutes the aerosol upstream of the torch, reducing sample load to the plasma and enabling direct analysis without additional reagents or dilution.

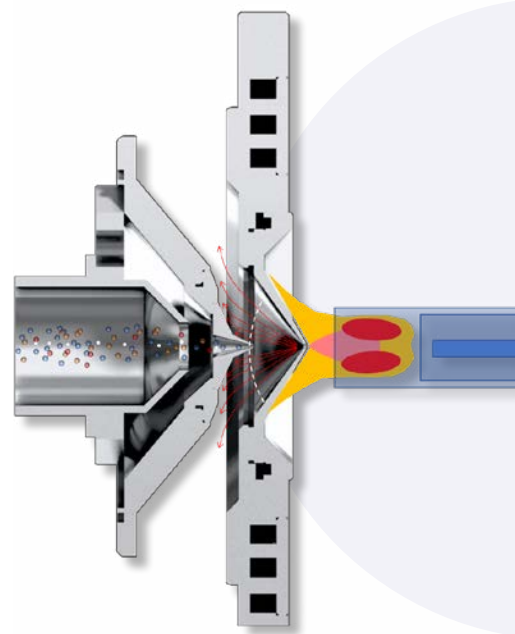


Injection by 12-rotor high-precision peristaltic pump

The twelve-rotor high-precision peristaltic pump is equipped as standard, with optional pump tubes made from various materials such as PVC, Solva, Tygon, and Viton to support conventional and organic solutions as well as long service life. Optional flared pump tubes further reduce operating difficulty.



Reliable Double Taper Ion Interface



Optimized ion interface design

The improved double-taper interface enables the transition from atmospheric pressure to high vacuum. It ensures efficient extraction of representative ions while reducing vacuum load.

Aerodynamic simulation-based design

- The double cone design is optimized, and the performance of the instrument is greatly improved.
- The salt deposition is reduced, and the matrix resistance is improved.

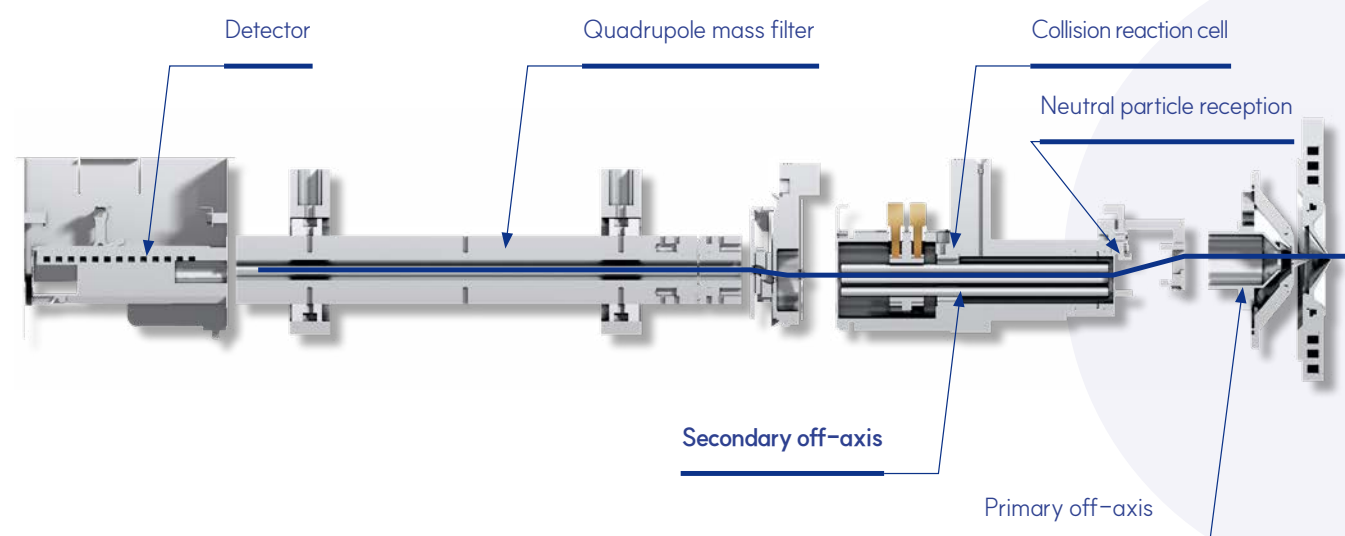


Extraction lens

- Any voltage from -200 to $+5V$ can be applied on the lens, and the extraction voltage can be adjusted arbitrarily for different ions and sample matrices.
- The positive voltage can completely isolate the ions, prevent the ions from entering the ion optical system, and cause unnecessary pollution during standby.

Simple handle type taper switching system

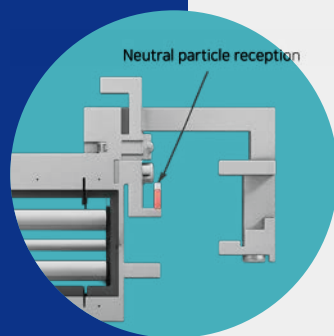
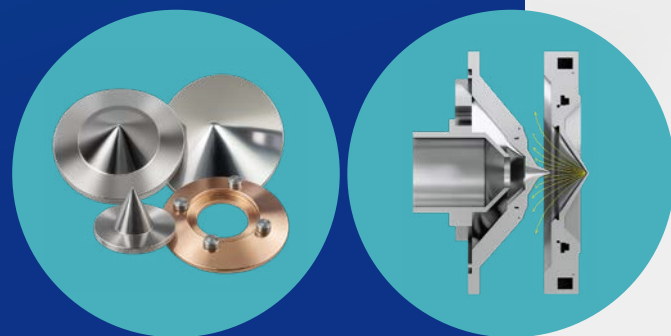
- Innovative handle-type taper switching system with interlock protection to prevent abnormal operations
- Easy maintenance through taper switching, with no need for vacuum venting



High-efficiency ion optical system

- The double taper interface realizes efficient transport of ions under analysis.
- The two off-axes in the front and at the back can effectively eliminate the interfering particles (neutral particles, electrons, photons).
- The collision reaction cell technology and distributed intake system minimize the interference.
- The pure molybdenum quadrupole mass analyzer is the most stable choice for high-resolution mass spectrometry.
- The dynamic range of the dual-mode discrete dynode is up to $9 \sim 10$ orders of magnitude.

Composite Ion Transport System



Unique ion channel

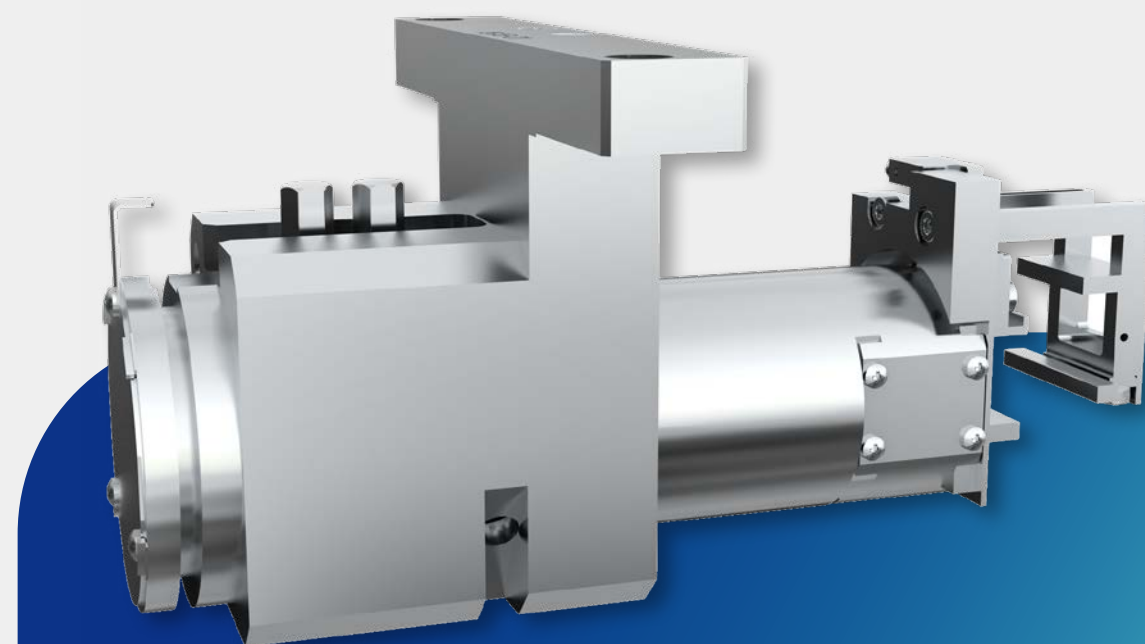
The channel can be flexibly deployed under high-sensitivity mode or salt resistant mode by interface technologies. The interface cone material is either nickel or platinum.

- The high-salt resistance mode ensures the stability of long-term analysis of high salt samples.
- The high-sensitivity mode can meet the application requirements of high-throughput analysis of different types of samples.

Open ion deflection lens

- The big opening primary deflecting lens can improve the ion transmittance and enhance the sensitivity.
- The special neutral particle reception system allows the ion lens to be cleaned without replacement.

High-Speed Dynamic Collision Reaction Cell

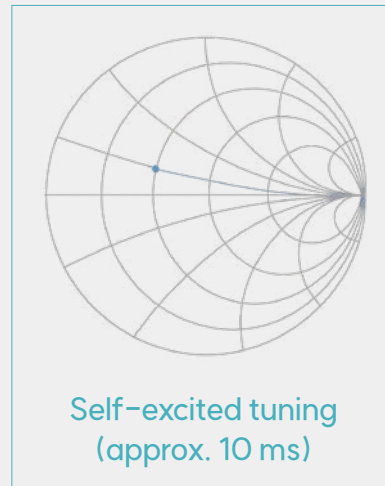
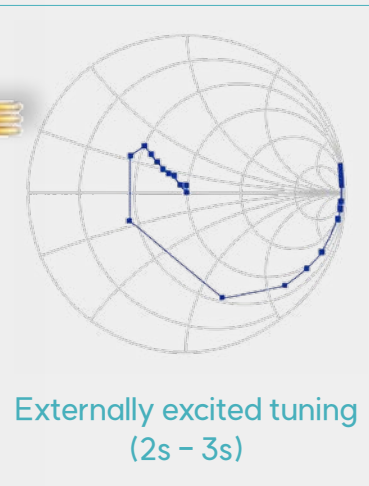


- The collision reaction cell with compound electric field has the advantages of small cell volume and high ion transfer efficiency.
- The distributed collision / reaction gas diffusion results in a good gas distribution in the cell, and thus greatly improves the collision efficiency and sensitivity.
- The Kinetic Energy Discrimination (KED) provides excellent interference elimination capability.
- Direct injection of diluted / serum sample can be performed, which provides good interference resistance.

05 Stable ICP Ion Source

Self-excited all-solid-state ICP ion source

- No matching box needed, millisecond-level fast frequency conversion to match with plasma load changes, and stable plasma operation
- Improved matrix resistance, such as direct injection of buffer salt in arsenic speciation analysis
- Capable of analyzing volatile organic solvents, including 100% acetonitrile and 100% methanol
- Balanced drive to reduce ion kinetic energy dispersion and secondary ion generation, without the need for shielding
- Water cooling to ensure long-term stability



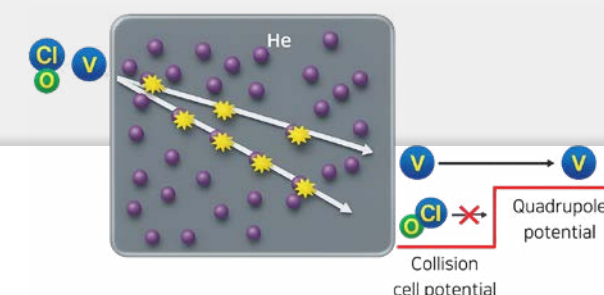
RF Power Supply

06 Outstanding Interference Elimination Capability

Collision mode + KED to eliminate interference on mass spectrometry

The polyatomic ions introduced by the solvent and sample matrix may result in serious interference in some target analytes. Therefore, the collision reaction cell (CRC) technology is used to eliminate this interference in quadrupole ICP-MS instruments. Ionix 7100 is equipped with a new hexapole collision reaction cell system, which greatly enhances the interference elimination efficiency through collision, while maintaining the high-efficiency ion transmission capability. Combined with the KED working

mode, Ionix 7100 provides unparalleled performance in the simultaneous analysis of multiple elements in complex matrix samples. The waterfall flow type distributed gas injection system can achieve gas replacement in the cell most efficiently and quickly. The system can, while improving the collision effect, greatly improve the gas replacement speed, and reduce the analysis waiting time.



Kinetic Energy Discrimination (KED) mode:

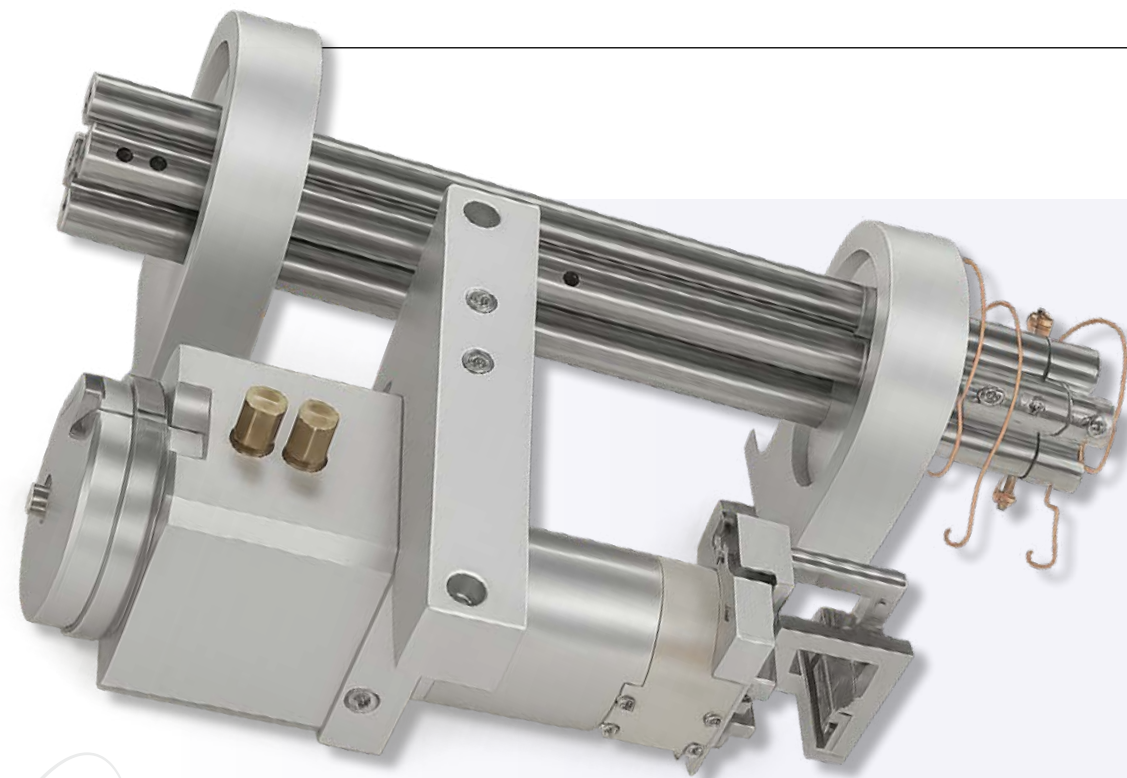
In KED mode, both analyte ions and polyatomic ions undergo collisions with He atoms. Because polyatomic ions are larger, they experience more frequent collisions and therefore lose more kinetic energy. As a result, polyatomic interferences are effectively discriminated against, while analyte ions are transmitted to the mass analyzer.

At the cell outlet, the kinetic energy of the target ions and interfering ions differs significantly based on the number of collisions each has encountered. The polyatomic interferences, being larger in size, experience higher collision

rates and a substantial loss of energy. This allows a potential well at the quadrupole entrance to selectively block these low-energy interferences, preventing them from entering the mass analyzer while allowing target analytes to pass through.

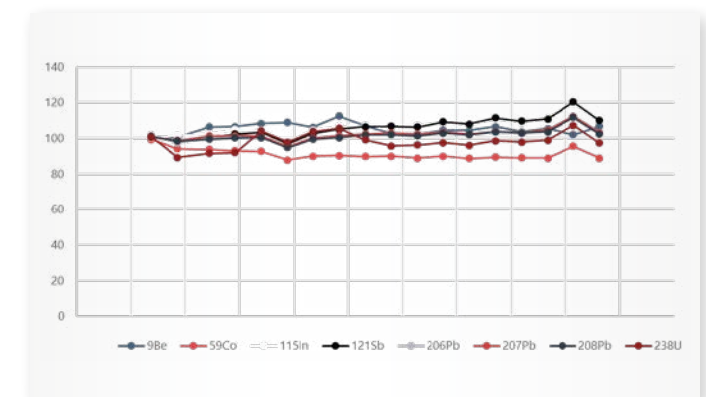
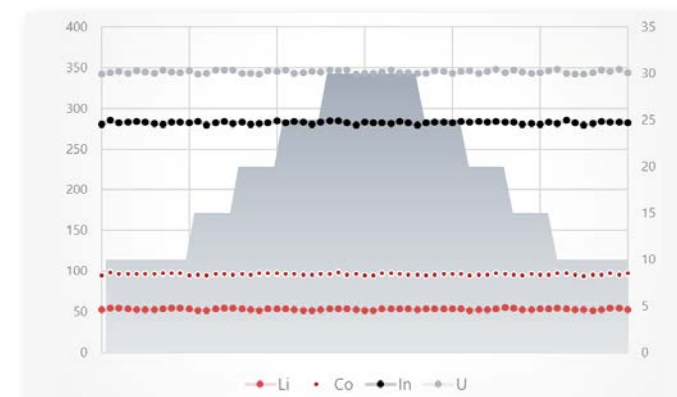
The detection of trace V (Vanadium) in blood samples is easily interfered by ClO ions. It is difficult to detect the level of V of < 0.1 ppb in the conventional collision cell. Ionix 7100's hexapole collision cell, in combination with KED, can be used to detect trace V in the blood sample accurately.

High-Precision Quadrupole Mass Analyzer



Unique pure molybdenum quadrupole

- The use of pure molybdenum provides superior thermal stability, optimizing the Mathieu stability regions to achieve industry-leading precision in mass spectrometry.
- The high-precision pure molybdenum quadrupole ensures outstanding mass stability and accurate analytical performance.

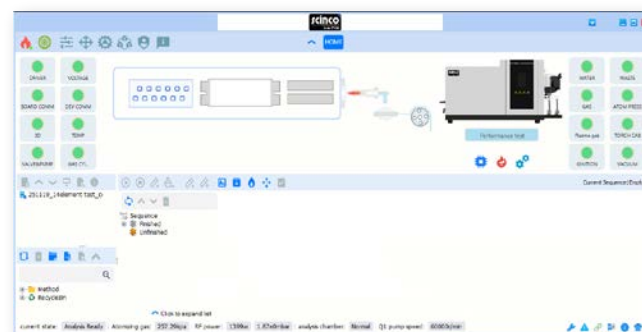
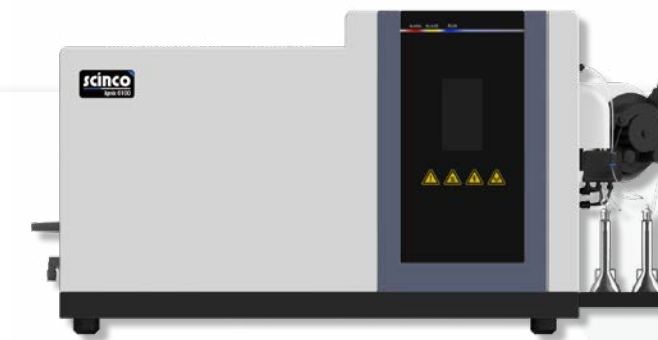


IonixMaster Software

for intuitive instrument control and streamlined method development

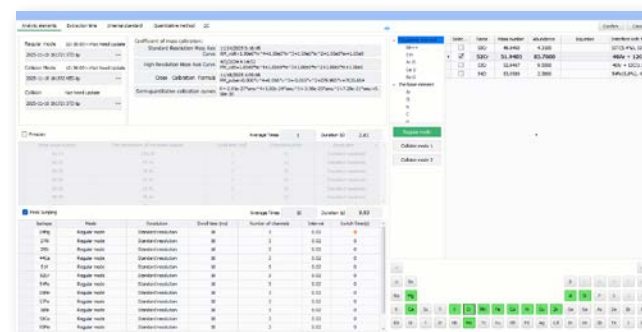
IonixMaster software features an intuitive Windows-based interface designed for efficient operation and reliable analytical performance. Intelligent automation, guided workflows, and real-time visualization allow users to quickly set up methods, optimize parameters, and monitor instrument status with confidence.

The software integrates comprehensive method management, advanced data processing, and built-in diagnostic functions to ensure data integrity and system safety. With automated tuning, customizable reporting, and support for online coupled systems such as HPLC-ICP-MS, the IonixMaster software delivers both ease of use and flexibility for routine analysis and advanced applications.



1 Intelligent Control & Diagnostics

- Windows-based GUI with real-time system and plasma monitoring
- Automatic tuning and built-in diagnostics ensure stable and safe operation



2 Method & Workflow Management

- Built-in standard methods and user-defined method management
- Explorer-style interface for efficient and repeatable analysis



3 Calibration Curve & Quantification

- Automatic multi-point calibration with excellent linearity
- Reliable quantitative analysis across a wide dynamic range



4 Mass Spectrum Visualization

- Real-time mass spectrum display with clear peak separation
- Enables accurate qualitative and quantitative analysis