SHINE

ION CHROMATOGRAPH



ISO 9001

CE



About Us

Qingdao Shenghan Chromatograph Technology Co., Ltd. (SHINE) was established in 2002, specializing in the R&D, production, sales and after-sales service of ion chromatograph and relevant parts. It is a high-tech enterprise with ISO 9001 quality management system certification and ISO 24001 environmental management system certification. The total number of independent intellectual property rights, patents and software copyrights belonging to SHINE is about 100.

At present, the company has 4 series of ion chromatograph:desktop IC, portable IC, online IC and customized IC , which are widely used in environmental protection, food and drug, hydrogeology, petrochemical, health and epidemic prevention, electronic and electrical, scientific research and other industries. It basically meets the requirements of routine and trace detection of anion, cyanide, iodide, sugar, small molecular organic acid, etc. At present, it has provided perfect solutions for 5000 + users in different industries and exported to more than•• countries and regions . In addition, SHINE is one of the few enterprises in the world that can realize mass production of IC columns.





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In 2012, 2013 and 2016, SHINE has undertaken “National Major Scientific Instrument and Equipment Development Projects” for 3 times, and won the special "Science and Technology Enterprise Innovation Fund" project and the "National Key New Product Plan" project of the Ministry of Science and Technology. It is a “Individual Champion of Manufacturing Industry in Shandong”and "The Third Batch of National Manufacturing Industry Single Champion Cultivation Enterprises", and was shortlisted in “2019 Shandong High Tech Top 50 Brand” list and become “China's Top 500 Patent Enterprises”.

To protect the rights and interests of users, SHINE has set up a powerful after-sales service team with 24-hour free customer service hotline, 8 authorized after-sales service stations in China, and cooperates with foreign local agents to ensure response within 2 hour and relieve users' worries.

Through rapid development, the company has grown in enterprise scale, R&D and market share. It is a highly recognized solution provider for ion chromatography in China.

OUR HONOR



National Individual Champion Cultivation Enterprise of Manufacturing Industry





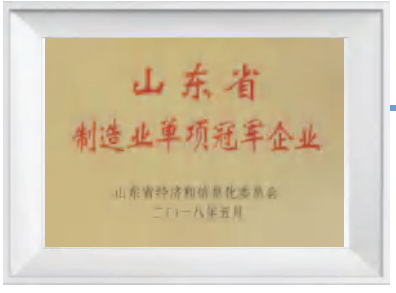
Science and Technology Award



Gold Award of MEI Awards



The Hidden Champion of Qingdao Industrial Enterprises



Individual Champion of Manufacturing Industry in Shandong



Shandong Gazelle Enterprise



CERTIFICATION



Quality/Environmental / Occupational Health and Safety Management System Certification





CE certification



Invention Patent
*68

Industrial Design Patent
*52

Utility Model Patents
*15

Software Copyright
*6

TYPICAL USER



SOCIAL RESPONSIBILITY

SHINE is an enterprise full of responsibility. Besides making better IC, SHINE is always trying to do some contribution for society, such as :

Establish Qingyuan Da special fund for public welfare;
Setting up the scholarship for the college students;
Establishing SHINE chromatography class;
Supporting the disaster detection ;
Building a SHINE hope school in poor area;
SHINE set the first Saturday of November every year as public service day to make public welfare normal;
To fight against COVID-19, SHINE donated 15000 masks to Wuhan.



SHINE hope primary school



Public service day



Qingyuan Da special fund for public welfare

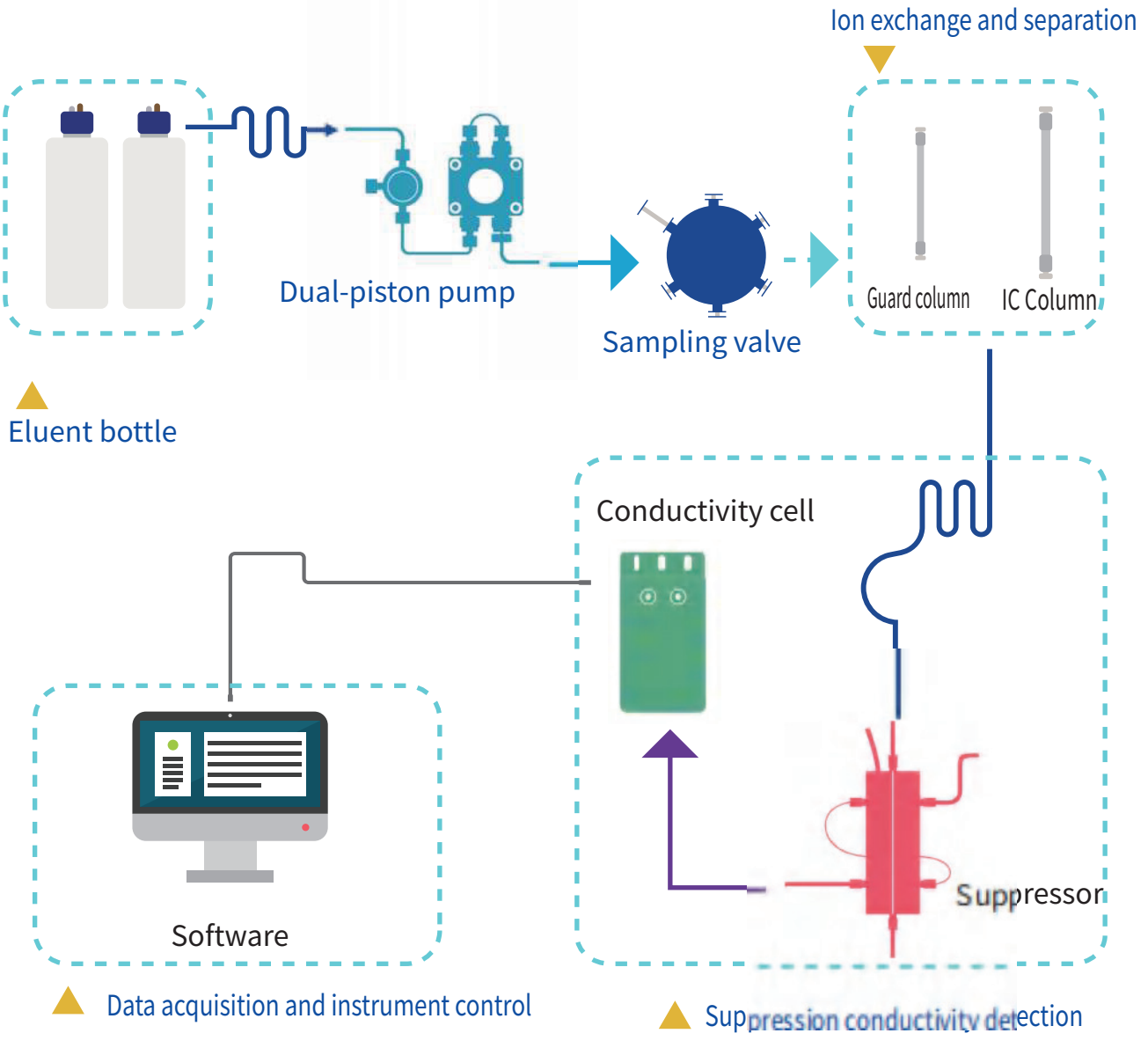


Donating mask to fight against COVID-19

ION CHROMATOGRAPHY FLOW DIAGRAM

Ion exchange chromatography is a separation technology. The dissociatable ions on ion exchange resin exchange reversibly with the solute ions with the same charge in mobile phase. Ions are separated because of their difference in affinity to ions exchangers. So ion chromatograph is generally applicable to the separation and detection of hydrophilic anions and cations.

After the sample is injected, the ions to be analyzed are exchanged with dissociatable ions on the ion exchange resin at first (i.e. retained on the analytical column). When NaOH solution is used as eluent to analyze F^-, Cl^- and SO_4^{2-} in the sample, the ions retained on the analytical column are replaced by OH^- in the eluent, and the ions with weak affinity to the resin are eluted firstly. This is the separation process of ion chromatography. The eluent is suppressed by a chemical suppressor which can reduce the background conductance of the eluent. Then the ions to be analyzed can be measured accurately when it entered into the conductivity cell, and the detection signal can be outputted.



PRODUCT INTRODUCTION

Our company now has four series of ion chromatograph: desktop IC, portable IC , on-line IC and customized IC.

The new D-series desktop IC has been greatly improved in instrument stability, intelligence, convenience, functional diversity, and play an important role in the detection of common anions, cations and trace ions.

Portable IC can meet the needs of rapid on-site detection of unexpected events. It not only keeps the accuracy of laboratory IC, but also makes up for the application defects of laboratory IC with the characteristics of portability, on-site and rapid detection.

On-line IC perfectly realize on-line pretreatment, automatic sampling, automatic data processing and other functions, which can continuously detect atmospheric and water quality. On-line combustion IC system provides a simple and reliable way for on-line detection of halogen and sulfur in solid and liquid samples,which greatly expands the application field of IC.

Customized IC is to upgrade the original instruments according to customer requirements.

SHINE IC products are widely used in many industries, such as environmental protection, hydrogeology, petroleum, chemical industry, food, pharmacy, health, epidemic prevention, electronics, electricity and scientific research.



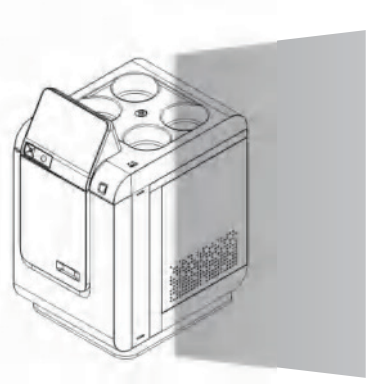
Desktop IC



Portable IC



On-line IC



Customized IC

LABORATORY IC



CIC-D100 ion chromatograph is a classic product of SHINE, which has been accepted by many customers.Based on the latest requirements of users,a newly upgraded CIC-D100 for conventional detection came into being.The new IC not only can detect anions, cations and other polar substances in different matrix samples, but also separate ions with 4 orders of magnitude difference.Compared with the previous one, it is more accurate and reliable. One key switch and intelligent maintenance functions are added to give users a better experience. It is suitable for commercial labs, enterprises, environmental protection, chemical industry, mining & metallurgy ,etc.

Technology Advantage:

- **Auto-range Conductivity Detector**
  It can directly detect the signal from ppb to ppm concentration without adjusting the range;
- **Eluent preheating**
  By keeping the temperature of the eluent entering the column constant to ensure data stability;
- **Intelligent switch**
  Just click once to complete the startup parameter setting and shutdown operation;
- **Multiple detectors available**
  Standard : conductivity detector
  Optional: ampere, UV, mass spectrometer and other detectors.

Technical Parameter:

Pump
Maximum Pressure：42MPa
Flow Rate Range:0.001~9.999mL/min

Column Heater
Operating Temperature Range:20 ~60°C(68~140°F)
Temperature Accuracy:±1°C
Temperature Stability:≤0.05°C/h

Power Requirements:150W
Dimensions(L*W*H*):310*430*530 (mm)
Net Weight(KGS):22
Gross Weight(KGS):29

Injector
Maximum Pressure:35MPa
External Diameter of The Tube:1/16"

Conductivity Detector
Cell Volume:≤0.8μL
Detection Range:0~35000μS/cm
Baseline Noise:≤0.001μS/cm
Baseline Drift:≤0.02μS
Temperature Range:Room temperature+5~60°C(41 ~140°F)
Maximum Pressure:10.0MPa



CIC-D120

CIC-D120 is a high-stability ion chromatograph with upgrade circuit . It can be compatible with external equipment such as amperometric detector, UV detector, ultraviolet-post-column derivatization device and so on. Using SHINE leading IC column technology, the separation of anion, cation, cyanide, iodide, sugar and small molecular organic acids can be realized. It is widely used in the fields of environment, disease control, food, chemical industry, electronics, mining and metallurgy.

Technology Advantage:

- **Temperature-control bipolar conductivity detector (CN 202033335U)**
  Greater detection range and better accuracy of analysis;
- **Built-in circulating 3D constant temperature technology (CN 204259917U)**
  Temperature stability time is less than 30 mins, ensuring the accuracy and reliability of test data;
- **The world's leading full-range series of ion chromatographic columns (CN 105126936A、CN 104788603A)**
  High efficiency, large capacity ,available to detect various ions;
- **Self-regenerating electrolytic micro-membrane suppressor (CN 102735792A)**
  High pressure resistance, small dead volume and highly responsive to signals;
- **Observatory intelligent software**
  Integrated control, compatibility for a variety of instruments,customized images,multiple languages.

Technical Parameter:

Pump

Maximum Pressure: 42MPa
Pressure Display Accuracy:⩽0.1MPa
Flow Rate Range:0.001~9.999mL/min

Injector

Maximum Pressure: 35MPa

Power Requirements:150W
Dimensions(L*W*H*):350*470*510 (mm)
Net Weight(KGS):26
Net Weight(KGS):32

Conductivity Detector

Cell Volume:⩽0.8μL
Detection Range:0~45000μS/cm
Detection Resolution:⩽0.0020nS/cm
Electronic Noise:0.02nS
Temperature Range:Room temperature+5~60°C(41 ~140°F)
Maximum Pressure:10.0MPa

LABORATORY IC



CIC-D150

CIC-D150 ion chromatograph is designed for the intelligentization, which realizes the functions of remote control by mobile APP, timing startup and preheating, one-key intelligent maintenance, etc. it is more convenient to use and greatly improves the productivity and user experience of the laboratory.

Technology Advantage:

- **Leakage alarm,the pump will stop automatically after 5 minutes if no treatment;**
- **Auto-range to realize the simultaneous determination of 5ppb-100ppm concentration sample without setting the range;**
- **A micro gas-liquid separator is set to remove the bubble from the eluent;**
- **By timing startup and preheating function ,users can set the start-up and all parameters of the instrument in advance (the maximum setting is 24 hours);**
- **Set "intelligent maintenance", the instrument can complete the flow path switch to the pure water path;**
- **The mobile APP can remotely control the instrument on / off and observe the operation performance parameters of the instrument;**
- **The large screen displays the operation parameters and status of the instrument.**

Technical Parameter:

Pump

Maximum Pressure:42MPa
Pressure Display Accuracy:⩽0.1MPa
Flow Rate Range:0.001~9.999mL/min

Injector

Maximum Pressure:35MPa

Conductivity Detector

Cell Volume: ⩽0.8μL
Detection Range:0~45000μS/cm
Baseline Noise:⩽0.001μS
Baseline Drift:⩽0.001μS
Detection Resolution: ⩽0.0020nS/cm
Electronic Noise:0.02nS
Temperature Range:Room temperature+5~60°C(41 ~140°F)
Maximum Pressure:10.0MPa

Power Requirements:150W
Dimensions(L*W*H*):336*650*458(mm)
Net Weight(KGS):26
Gross Weight(KGS):32



CIC-D160

CIC-D160 is a high-stability ion chromatograph with upgraded circuit technology ,which can detect anion, cation, cyanide, iodide, sugar and small molecular organic acids . It is widely used in the fields of environment, disease control, food, chemical industry, electronics, mining and metallurgy.

Technology advantage:

- **Built-in eluent generator, free from configuring eluent, with gradient elution available**
- **Built-in low-pressure degassing technology to eliminate bubble interference for stability**
- **Modular design, convenient to assemble and disassemble , easy to operate;**
- **Optional intelligent automatic injection system for large sample volumes, which features automatic dilution to save labor and time;**
- **Work across a variety of detectors, to expand the scope of applications of ion chromatography.**

Technical Parameter:

Pump

Maximum Pressure: 42 MPa
Pressure Display Accuracy: ⩽0.1MPa
Flow Rate Range:0.001~9.999mL/min

Power Requirements:150W
Dimensions(L*W*H*):350*470*650 (mm)
Net Weight(KGS):34
Gross Weight(KGS): 40

Conductivity Detector

Cell Volume: ⩽0.8μL
Detection Range: 0~50000μS/cm
Detection Resolution:⩽0.0020nS/cm
Electronic Noise:0.02nS
Temperature Range:
Room temperature+5~60°C(41 ~140°F)
Maximum Pressure:10.0MPa

Built-in Eluent Generator

Eluent Types : KOH/NaOH
Eluent Concentration Range :0.1-100mM
Concentration Increment :0.1mM
Flow Rate Range:0.1-5.0mL/min
Pressure:⩽30MPa

LABORATORY IC



CIC-D180

CIC-D180 is a new generation of intelligent ion chromatograph of SHINE. The simple pipeline layout and various component configurations make CIC-D180 flexible and changeable. It can be equipped with various detectors on demand to realize the combination technology easily. It can also be transformed into dual system and two-dimensional ion chromatograph, which is suitable for various application scenarios.

Technology advantage:

- **High definition touch screen can display the flow path and running status of the instrument in real time, operate with one key and view at any time;**
- **The built-in eluent generator generates high-purity KOH and MSA eluent by electrolysis, which saves manual configuration time and completes more detection items by gradient elution;**
- **Built in gas-liquid separation system can filter out the bubbles in the flow path, enhance the stability;**
- **In the heating degassing unit, there is an integrated on-line vacuum chamber, which can remove the gas in the eluent on-line to make the experimental results more accurate;**
- **The intelligent alarm function can recognize the leaks;**
- **Using intelligent detector to detect the residual liquid in the eluent cartridge in real time;**
- **Clarity software can realize the detection and control of each component of the platform, and output the analysis results.**
- **Mobile APP can master every step of analysis in real time without manual attendance, making the work easy and efficient.**

Technical Parameter:

Pump

Maximum Pressure:42 MPa
Pressure Display Accuracy:⩽0.1MPa
Flow Rate Range:0.001~9.999mL/min

Power Requirements:150W
Dimensions(L*W*H*):500*360*550 (mm)
Net Weight(KGS):32
Gross Weight(KGS):40

Conductivity Detector

Cell Volume:⩽0.8μL
Detection Range: 0~50000μS/cm
Detection Resolution:⩽0.0020nS/cm
Electronic Noise:0.02nS
Maximum Pressure:10.0MPa

Built-in Eluent Generator

Eluent Types : KOH/MSA
Eluent Concentration Range :0.1-100mM
Gradient Accuracy :0.2%
Flow Rate Range:0.1-5.0mL/min
Pressure:⩽30MPa



CIC-D300

CIC-D300 is a kind of ion chromatograph with dual-channel system design. It has stable performance and powerful function. The workstation of the observatory realizes the integration of the two-channel workstation, which is easy and fast to operate and doubles the work efficiency.

One machine can meet the detection requirements of environment, food, chemical industry, electric power, disease control, electronics, mining and metallurgy and other fields.

Technology Advantage:

- **Cation and anion dual-channel system, with both channels operating independently without disturbing each other. It can realize the simultaneous detection of anions and cations;**
- **Eluent thermal buffer system in which eluent enters into the columns after preheated, to avoid bubbles generated from rapid heating;**
- **Intelligent flow path mode, one-key operation to complete flow path switch, automatic cleaning to save time and labor;**
- **Built-in low-pressure degassing technology to eliminate bubble interference for more stability;**
- **The world's leading full-range series of chromatographic columns able to detect of ions with varied compositions.**

Technical Parameter:

Pump

Maximum Pressure: 42 MPa
Pressure Display Accuracy: ⩽0.1MPa
Flow Rate Range: 0.001~9.999mL/min

Built-in Eluent Generator

Eluent Types :KOH/NaOH/MSA
Eluent Concentration Range : 0.1-100mM
Concentration Increment: 0.1mM
Flow Rate Range:0.1-5.0mL/min
Pressure:⩽30MPa

Conductivity Detector

Cell Volume:⩽0.8μL
Detection Range:0~50000μS/cm
Detection Resolution:⩽0.0020nS/cm
Electronic Noise:0.02nS
Temperature Range:Room temperature+5~60°C(41 ~140°F)
Maximum Pressure:10.0MPa

Power Requirements:350W
Dimensions(L*W*H*):500*500*760(mm)
Net Weight(KG): 48
Gross Weight(KG):73

LABORATORY IC



CIC-D300+

As a new generation of intelligent dual channel ion chromatograph, CIC-D300 plus is the latest ion chromatograph independently developed and produced by SHINE in terms of software and hardware. Each channel operates independently at the same time without mutual interference, realizing the simultaneous detection of cation and anion.

Technology Advantage:

- 10 inch HD touch screen: real time display of flow path and operation status of the instrument;
- Built-in double membrane eluent generator: no need degassing pipe and capture column, has pressure resistance of 30MPa, simpler flow path and smaller dead volume;
- Ultra pure online purification module: it can purify water online and reduce the water requirements of the instrument, so as to reduce the baseline background and improve the signal-to-noise ratio;
- Suction sampling system: use peristaltic pump to suck samples to reduce cross pollution at the injection port;
- The gas-liquid separator will remove most of bubbles entering the flow path, and the constant pressure and low pressure degasser will continuously remove the residual gas dissolved in water;
- Secondary infusion system: plunger pump and peristaltic pump secondary infusion system, combined with ultra pure on-line purification module and low-pressure gas-liquid separator, provide the most stable infusion scheme for the system.
- Integral heating and insulation system: multi-point temperature control and overall insulation design are used to deal with extreme environment, and provide eluent preheating for flow path to ensure instrument stability;
- Powerful safety assurance system: including eluent consumption alarm, liquid leakage alarm, low pressure alarm, overpressure alarm, fault alarm to reduce possible hurt by misoperation.

Technical Parameter:

Pump

Maximum Pressure: 42 Mpa
Pressure Display Accuracy: ⩽0.1MPa
Flow Rate Range: 0.001~9.999mL/min

Built-in Double Membrane Eluent Generator

Eluent Types :KOH/MSA
Eluent Concentration Range : 0.1-100mM
Concentration Increment: 0.1mM
Flow Rate Range:0.1-5.0mL/min
Pressure:3-30MPa

Conductivity Detector

Cell Volume:⩽0.8μL
Detection Range:0~50000μS/cm
Detection Resolution:⩽0.0020nS/cm
Electronic Noise:⩽0.0003μS/cm

Mobile Phone APP

Message Push and Control Delay：＜1s
App Access Response Time: <10ms

Power Requirements:350W
Dimensions(L*W*H*):580*487*640(mm)
Net Weight(KGS): 60
Gross Weight(KGS):70



CIC-P60
Portable Ion Chromatograph

Portable IC not only keeps the accuracy of laboratory IC, but also makes up for the application defects of laboratory IC with the characteristics of portable, on-site and rapid detection.

Technology Advantage:

- **Powerful data processing system**
  Iconic display, customizable interface, integration of instrument control, data analysis and processing,data sharing module for on-site and remote data sharing through 4G network;
- **Quick columns for 5-min rapid detection**
  Original quick columns for on-site quick detection of anions and cations;
- **Intelligent flow path cleaning makes easier cleaning**
  The flow path is designed with a switching valve for free switch of eluent bottles and pure water bottles;
- **WIFI communication, real-time operation**
  Being equipped with a tablet/laptop makes real-time operation more flexible and convenient;
- **Upgrade-supported dual detectors(conductivity detector and ampere detector) to meet the needs of different industries.**

Technical Parameter:

Pump
Maximum Pressure: 42MPa
Flow Rate Range: 0.001~9.999mL/min
Flow Accuracy: ±0.5%
Flow Repeatability : RSD≤0.1%

Injection Valve
Maximum Pressure: 35MPa
Control Mode: By stepper motor
Power Requirements: 24V (DC)

Column Heater
Temperature Range:
Room temperature+5~60°C(41 ~140°F)
Temperature Stability: ≤0.5°C/h

Suppressor(anion/cation)
Bearable Pressure:6MPa
Dead Volume: ≤0.8uL

Conductivity Detector
Cell Volume: ≤0.8μL
Measure Range: 0~45000μS/cm(adjustable)
Controlling Temperature Range:
Room temperature+5~60°C(41 ~140°F)(adjustable)
Maximum Pressure: 10MPa
Baseline Noise: ≤0.5%FS
Baseline Drift: ≤20%FS/30min
Pressure Range: 5MPa-20MPa

Panel Computer
Display Screen: 12.3inch
Internal Memory: 128G
Weight: 786g

Power Requirements: 150W
Dimensions(L*W*H*):
440*226*420 (mm)
Net Weight(KGS): 8
Gross Weight(KGS): 11



SH-GIC7000 On-line Atmosphere Ion Chromatograph

SH-GIC7000 is a full-automatic and intelligent on-line IC for atmosphere, which can detect anions and cations in TSP, PM2.5, PM10 and dustfall to meet the testing requirements of HJ799-2016 and HJ800-2016.The instrument runs continuously for 24 hours and can work continuously for 20 days after one maintenance.

Full plasticized flow system, dual suppression mode, all-weather continuous operation, remote control, remote data transmission and so on make the IC has perfect and advanced solution ability, which brings automatic , intelligent and humanized instrument application experience to users.

Technology Advantage:

- **Anions and cations in particulate matter or gas samples can be simultaneously detected by anion-cation dual-channel method;**
- **Various sampling methods and modes can be selected to meet the requirements of gas and particulate matter samples with different particle sizes;**
- **Automatic data correction function, testing standard calibration curve regularly, to ensure the accuracy and effectiveness of test data;**
- **The instrument is equipped with thermostatic column and highly sensitive bipolar conductivity detector to make data stable and reliable;**
- **Special intelligent chromatographic software, icon operation interface, parameter setting and data observation are intuitive and convenient, real-time state monitoring in operation, accurate and reliable data processing;**
- **Automatic maintenance of equipment, regular self-check of equipment status, automatic cleaning;**
- **Remote data transmission can connect the network by wireless/wired way, upload the data to headquarters or server for backup and storage;**
- **Real-time recording of environmental temperature and humidity information makes traceability work has more auxiliary information.**



SH-WIC5000 On-line Water Quality Ion Chromatograph

SH-WIC5000 is a full-automatic and intelligent on-line water quality IC, which can realize real-time detection of anions and cations in water samples. The equipment removes organic impurities and solid particles from the samples to be measured by on-line pretreatment system, achieving the functions of continuous automatic sampling, sample pretreatment and data processing, and continuously uploads real-time monitoring data to headquarters or servers in 24 hours.

Full plasticized flow system, dual suppression mode, all-weather continuous operation, remote control, remote data transmission and so on, make the on-line water quality IC has perfect and advanced solution ability.The equipment can provide a complete solutions for the monitoring of inorganic anions and cations in water samples such as tap water, surface water, circulating water of power plants and water for enterprise production.

Technology Advantage:

- **Anions and cations can be simultaneously detected by anion-cation dual-channel method;**
- **Automatic data correction function, testing standard calibration curve regularly , to ensure the accuracy and effectiveness of test data;**
- **The instrument is equipped with thermostatic column and highly sensitive bipolar conductivity detector to make data stable and reliable;**
- **Special intelligent chromatographic software, icon operation interface, parameter setting and data observation are intuitive and convenient, real-time state monitoring in operation, accurate and reliable data processing;**
- **Automatic maintenance of equipment, regular self-check of equipment status, automatic cleaning;**
- **Remote data transmission can connect the network by wireless/wired way, upload the data to headquarters or server for backup and storage.**



SH-CIC3000 On-line Combustion Ion Chromatograph

The on-line combustion IC integrates combustion furnace , gas absorption and ion chromatography analysis . It combines pretreatment with detection process perfectly to provides a simple and reliable method for simultaneous on-line detection of halogen and sulfur in solid and liquid samples, which greatly expands the application field of IC.

The on-line combustion IC overcomes the shortcomings of traditional off-line pyrolysis methods. Samples can automatically enter into the on-line combustion system for qualitative and quantitative analysis, which greatly improves the analysis flux of samples. The whole combustion and absorption process are automatically completed by software control without any manual intervention. Without introducing internal standard, it simplifies the sample analysis process, avoids the introduction of pollution, and ensures the accuracy and stability of the analysis results.

Technology Advantage:

- **Completing qualitative and quantitative analysis of halogens and sulfur in combustible samples at the same time;**
- **Intelligent program control, can self-help complete sample analysis ;**
- **Precise liquid and gas control module to ensure full sample combustion and good reproducibility of methods;**
- **Built-in storage module, tailor-made special sample program upgrade package for customers;**
- **Unique design of pyrolysis water preheating and special quartz burning tube ensure the pyrolysis is complete,lasting and safe ;**
- **Modular design, combined SHINE independent R&D technology with foreign technology, ensures the reliability of the results.**

SH SERIES IC COLUMNS

Qingdao Shenghan Chromatograph Technology Co., Ltd.has been developing ion chromatographic column since 2008. As the only enterprise in China which can realize mass production of IC columns,SHINE breaks the monopoly of foreign countries. Professional R&D team and advanced production technology ensure that you can get IC columns with good reproducibility and separation effect at any time.

Anion Ion Chromatographic Columns(stainless steel)

Model	Specification (mm)	Function
SH-AC-3	4.0*250	Carbonate system；Simultaneously analyzing 7 kinds of common anions: F^-,Cl^-,NO_2^-, Br^-, NO_3^-, $H_2PO_4^-$, SO_4^{2-} and disinfection by-products of drinking water:ClO_2^-, BrO_3^-, ClO_3^-, DCA , TCA ; certain organic acids such as formic acid, acetic acid, tartaric acid and oxalic acid.
SH-AC-4	4.6*250	Carbonate system；Analyzing BrO_3^- in wheat flour,SO_3^{2-} and 7 kinds of common anions,as well as some organic acids such as oxalic acid and tartaric acid.
SH-AC-9	4.6*250	Carbonate system；Simultaneously analyzing 7 kinds of common anions：F^-, Cl^-, NO_2^-, Br^-, NO_3^-, $H_2PO_4^-$, SO_4^{2-}.The negative peaks of water and F^- peaks are well separated.
SH-AC-11	4.6*250	Hydroxide system；A bromate analysis column，can simultaneously analyze 7 kinds of common anion.
SH-AC-16	4.6*250	Hydroxide system;A special column for various phosphates(4 kinds, do not analyse 6 partial phosphoric acid at present) in aquatic products (fishes , shrimps and related products).
SH-AC-17	4.6*250	Hydroxide system; Analyzing I^- by conductance method, can also be used to analyze I^-, SCN^-, $S_2O_3^-$.
SH-AC-18	4.6*250	Carbonate system；Simultaneously analyzing 7 kinds of common anions:F^-,Cl^-, NO_2^-, Br^-, NO_3^-, PO_4^- , SO_3^{2-}.It Especially good at separating SO_3^{2-}.
SH-AC-19	2.1*200	Hydroxide system;A microbore anion column.With fine diameter, low flow rate, high signal response value,it can simultaneously analyze 8 kinds of anions:F^-, BrO_3^-, Cl^-,. NO_2^-, Br^-, NO_3^-, ,$SO4^{2-}$,PO_4^{3-}..
SH-AC-20	2.1*200	Carbonate system;A microbore anion column.With fine diameter, low flow rate, high signal response value,it can simultaneously analyze 8 kinds of anions :F^-, BrO_3^-, Cl^-,NO_2^-,Br^-, NO_3^-,$H_2PO_4^-$, SO_4^{2-}.
SH-AC-22	4.0*250	Hydroxide system;Having the characteristics of large capacity and high resolution. It can simultaneously analyze 8 common anions: F^-, BrO_3^-, Cl^-,NO_2^-,Br^-, NO_3^-,$H_2PO_4^-$, SO_4^{2-}. some small molecular organic acids and disinfection by-products, especially for the detection and analysis of F - in complex matrix such as fruit juice or tea.
SH-G-1	4.6*50	Universal guard column; Insoluble solid particles in mobile phase and samples can be filtered on-line.Used to prevent stainless steel column from being polluted and prolong the life of column.

Anion Ion Chromatographic Columns(peek)

Model	Specification (mm)	Function
SH-AP-1	4.6*250	Hydroxide system；With alkyl quaternary amine exchange group, it can be equipped with eluent generator to analysis 7 kinds of common anions (F^-,Cl^-,NO_2^-,Br^-,NO_3^-,$H_2PO_4^-$,SO_4^{2-})and some disinfection by-products.
SH-AP-2	4.0*250	Carbonate system；With alkyl quaternary amine exchange group, it can analysis 7 kinds of common anions(F^-,Cl^-,NO_2^-,Br^-,NO_3^-,$H_2PO_4^-$,SO_4^{2-}) and some disinfection by-products.
SH-AP-3	4.0*150	Carbonate system；With alkyl quaternary amine matrix , it can analysis 7 kinds of common anions (F^-,Cl^-,NO_2^-,Br^-,NO_3^-,$H_2PO_4^-$,SO_4^{2-}) rapidly.
SH-AP-4	4.0*250	Hydroxide system;With large column capacity and high resolution, it can be used for the analysis of F - and small molecular organic acids in complex matrices.
SH-GP-2	4.0*50	Universal guard column; Insoluble solid particles in mobile phase and samples can be filtered on-line.Used to prevent peek column from being polluted and prolong the life of column.

Cation Ion Chromatographic Columns(stainless steel)

Model	Specification (mm)	Function
SH-CC-3	4.6*100	MSA system;Polymer matrix weak acid cation column, can analyze 6 kinds of common cations：Li^+, Na^+, NH_4^+, K^+, Mg^{2+}, Ca^{2+}.
SH-CC-4	4.0*200	MSA system；Polymer matrix weak acid cation column,can analyze 6 kinds of common cations. High organic solvent tolerance.
SH-CC-6	3.0*250	MSA system;It is used for the determination of monovalent alkali metals, ammonium salts, divalent alkaline earth metals and choline.
SH-CC-7	2.1*200	MSA system;A microbore weak acid cation column.With fine diameter, low flow rate, high signal response value,it can detect 6 kinds of conventional cations at low concentration.
SH-CC-9	4.6*250	MSA system;It is sensitive to the change of eluent and is suitable for the analysis of sodium ammonium samples with high concentration difference ratio. It can complete the rapid separation of conventional cations and various organic amines.

MAIN CORE COMPONENTS

Suppressor

Suppressor produces H^+ and OH^- through electrolysis of water at the electrode, and under the combined action of electric field and ion exchange membrane,can realizes the directional migration and exchange of ions. It reduces the background conductance, improves the sensitivity of ions to be measured, and makes the "counter ion" in the sample enter the waste liquid.



Amperometric Detector

In the case of applied voltage, the amperometric detector detects the change of current caused by the redox reaction of the substance to be measured on the electrode surface. Amperometric detector is often used to analyse ions with low dissociation, which are difficult to detect with conductivity detectors and have electrical activity .



Eluent Generator

The double membrane eluent generator can produce high-purity KOH and MSA eluent by electrolysis, which saves the manual configuration time, the degassing pipe and capture column are not required, the pressure resistance can reach 30MPa, the flow path is simpler and the dead volume is smaller.At the same time, it can realize the gradient elution and separation operation of complex samples which can not be completed by the isocratic pump, which further improves the accuracy of the analysis.



Autosampler



SHA-7 Single channel



SHA-17 Single channel



SHA-16 Single /Dual channel

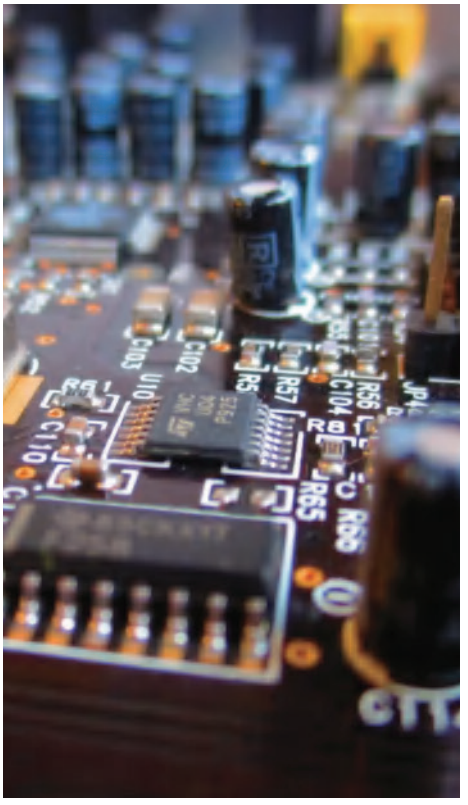




INDUSTRY APPLICATION SOLUTIONS







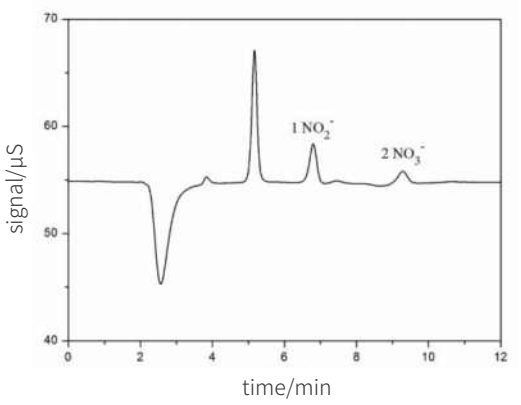




I .Application of Ion Chromatography in Food Safety Analysis

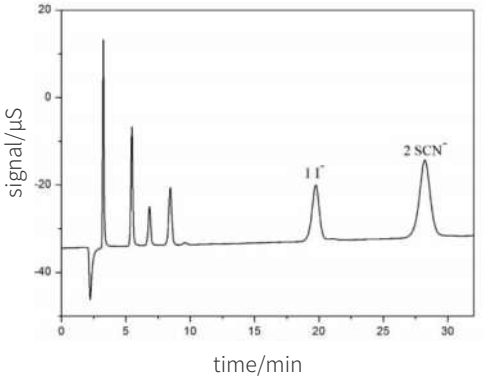
1. Nitrate and nitrite in food

The samples are pretreated according to GB/T 5009.33, and after protein precipitation and fat removal, the samples are extracted and purified by corresponding methods. Using CIC-D180 ion chromatograph ,SH-AC-5 anion column, 10.0 mM NaOH eluent and bipolar pulse conductance method,under the recommended chromatographic conditions, the chromatogram is as follows.



2. Iodide and thiocyanate in dairy products

The milk powder samples are dissolved, mixed with 3% acetic acid and deionized water, filtered by 0.22μm microporous filter membrane and treated by IC-RP column. Using CIC-D180 ion chromatograph, SH-AC-11 anion column, 30 mM NaOH eluent and bipolar pulse conductance method, under the recommended chromatographic conditions, the chromatogram is as follows.

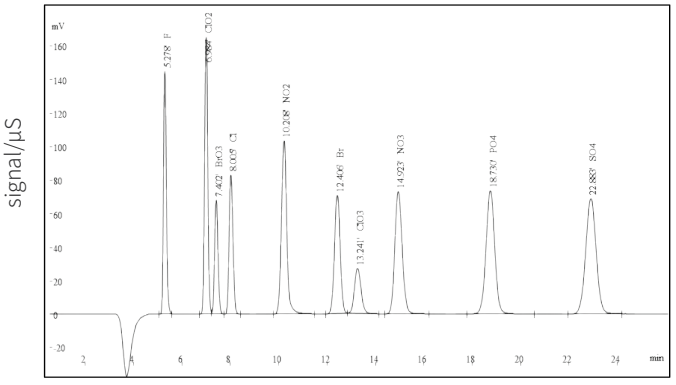




II . Application of Ion Chromatography in Drinking Water Analysis

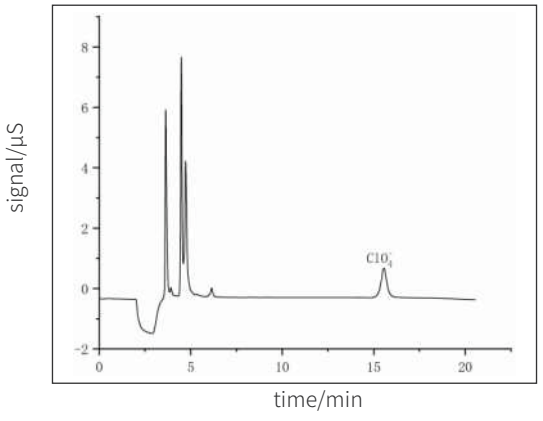
1. Detection of anions in drinking water

The samples are filtered by 0.45μm microporous filter membrane or centrifuged . Using CIC-D150 ion chromatograph, SH-AC-3 anion column, 2.0 mM Na_2CO_3/8.0 mM $NaHCO_3$ eluent and bipolar pulse conductance method,under the recommended chromatographic conditions, the chromatogram is as follows.



2. Determination of Perchlorate in Drinking Water (EPA 314.0)

Using CIC-D180 ion chromatograph, SH-AP-1 anion column, 35mmol/mL NaOH eluent ,under the recommended chromatographic conditions,the chromatogram is as follows.

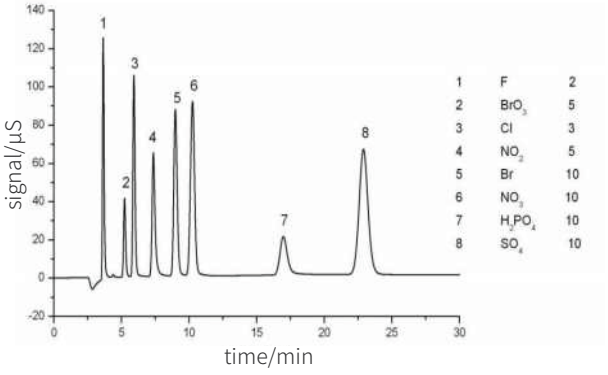




III. Application of Ion Chromatography in Environmental Analysis

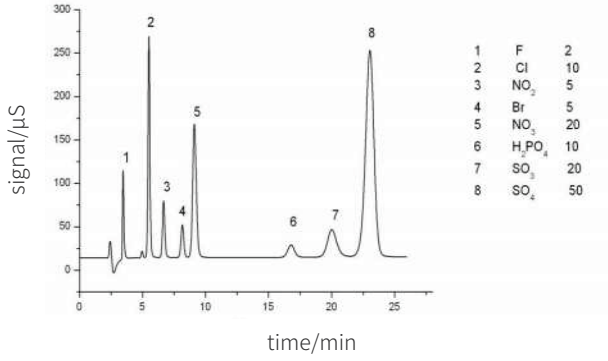
1. Detection of common anions in surface water

Surface water is generally relatively clean. After 30 minutes of natural precipitation, taking the non precipitation part of the upper layer for analysis. If there are many suspended substances in the water sample or the color is darker, pretreat it by centrifugation, filtration or steam distillation. Using CIC-D150 ion chromatograph, SH-AC-3 anion column, 3.6 mM Na_2CO_3+ 4.5 mM $NaHCO_3$ eluent and bipolar pulse conductance method,under the recommended chromatographic conditions,the chromatogram is as follows.

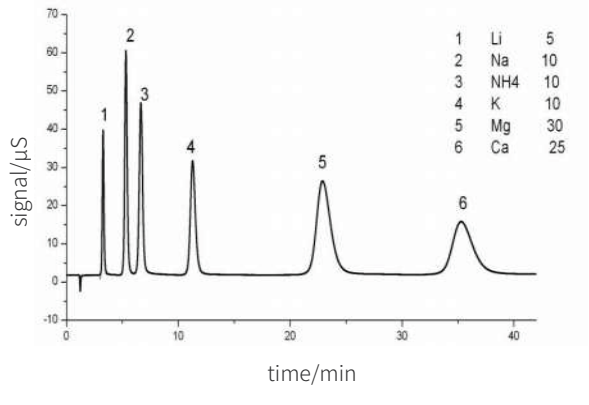


2.Analysis of particulates in atmosphere

The environmental samples of a certain volume or time are collected according to the sampling requirements of TSP, PM10, natural dust and dust storms in the atmosphere. A quarter of the filter membrane samples collected are accurately cut into plastic bottles,adding 20mL deionized water ,then volumed to 50mL after beening extracted in the ultrasonic cleaner and filtered by a 0.45μm microporous filter membrane. After all this,the sample can be injected for analysis. Using CIC-D150 ion chromatograph, SH-AC-3 anion column, 3.6 mM Na_2CO_3+4.5 mM $NaHCO_3$ eluent and bipolar pulse conductance method,under the recommended chromatographic conditions, the chromatogram is as follows.



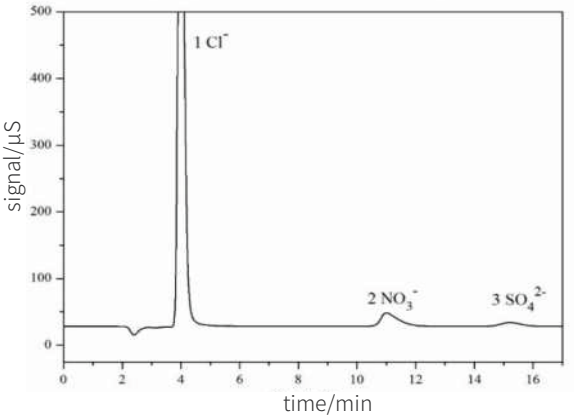
Using CIC-D150 ion chromatograph, SH-CC-3 cation column, 5.5 mM MSA eluent and bipolar pulse conductance method,under the recommended chromatographic conditions, the chromatogram is as follows.



IV. Application of Ion Chromatography in Petrochemical Analysis

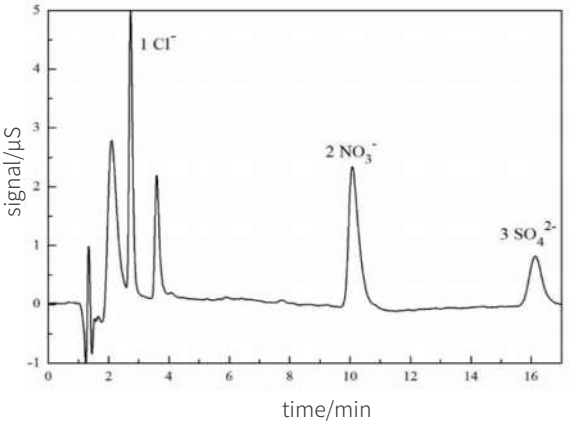
1. Anion analysis in oil field waste water

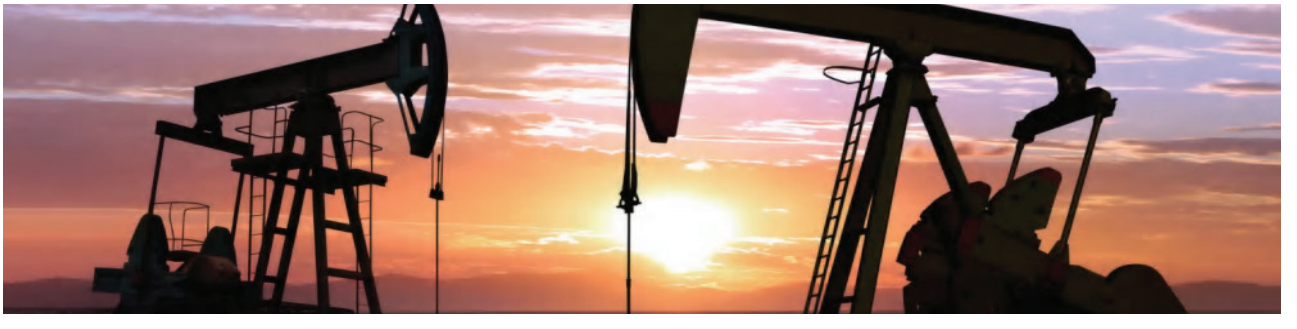
Choosing appropriate dilution ratio to dilute oil field waste water, the diluent was filtered by 0.22 um microporous membrane and treated by IC-RP column.If the sample contains heavy metal and transition metal ions, it must be treated by IC-Na column . Using CIC-D150 ion chromatograph, SH-AC-3 anion column, 3.6 mM Na_2CO_3+4.5 mM $NaHCO_3$ eluent and bipolar pulse conductance method,under the recommended chromatographic conditions,the chromatogram is as follows.



2. Oil analysis

Based on the flammability of petroleum, chlorine, nitrogen and sulfur in petroleum products are converted into hydrides and oxides at high temperature by combustion furnace, then absorbed by alkali liquor. Using CIC-D150 ion chromatograph, SH-AC-3 anion column, 3.6 mM Na_2CO_3+4.5 mM $NaHCO_3$ eluent and bipolar pulse conductance method, under the recommended chromatographic conditions, the chromatogram is as follows.

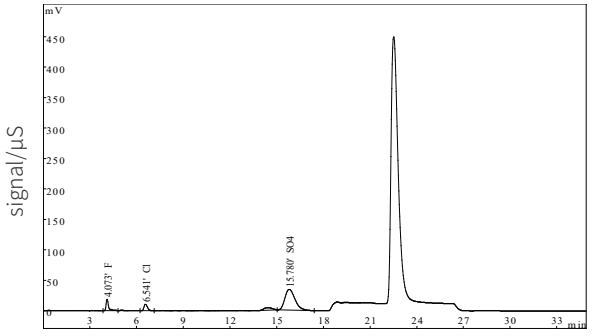




V .Application of Ion Chromatography in Lithium Battery

1. Anions in nickel hydroxide

Nickel hydroxide is the positive active material of Ni based batteries.Ion chromatography can be used to simultaneously detect the impurity anions to provide scientific basis for the production process and performance evaluation of various materials.Using CIC-D180 ion chromatograph, SH-AC-11 anion column and KOH (Gradient Eluent) eluent.Under the recommended chromatographic conditions,the chromatogram is as follows.

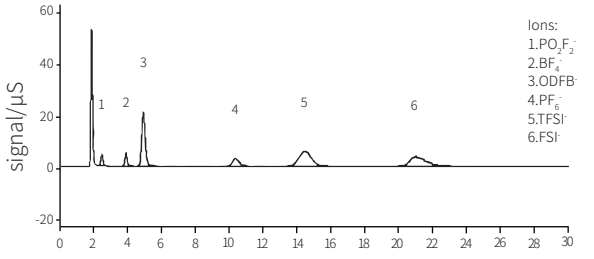


signal/μS

time/min

2. Anions in electrolyte

The sample needs to be diluted 1000 times, over 0.22 μ M filter membrane. Using CIC-D180 ion chromatograph, SH-AC-24 anion column and 10 mM KOH Eluent.Under the recommended chromatographic conditions,the chromatogram is as follows.



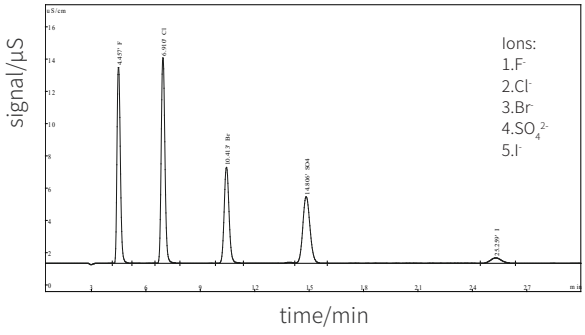
signal/μS

time/min



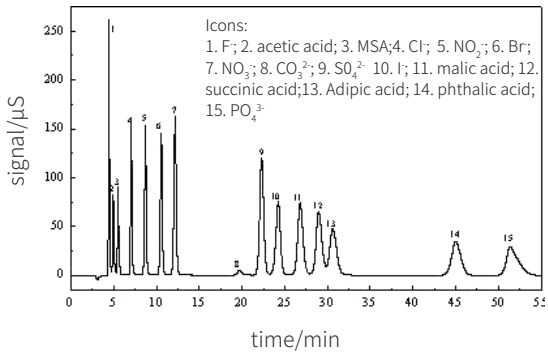
VI.Application of Ion Chromatography in Halogen Analysis

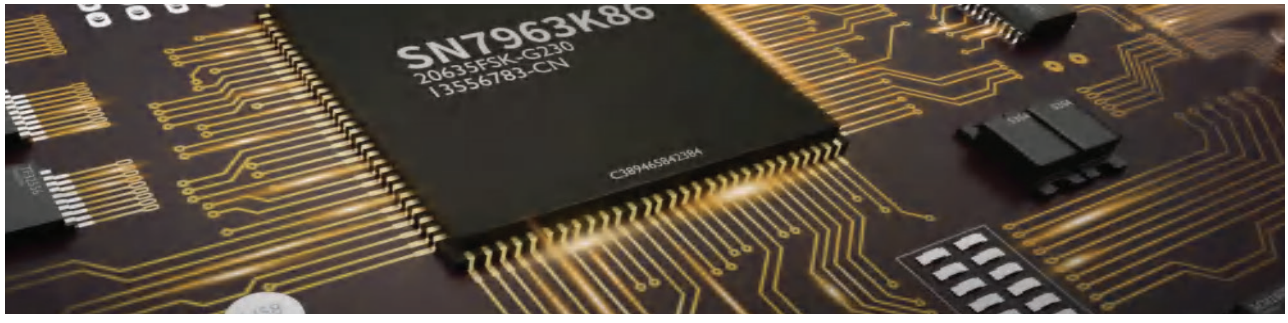
Using SH-CIC3000 on-line combustion ion chromatograph,SH-AC-11 anion column and 15 mM KOH Eluent.Under the recommended chromatographic conditions,the chromatogram is as follows.



VII.Application of Ion Chromatography in The Analysis of Synthetic Polymer Materials

Using CIC-D150 ion chromatograph, SH-AC-11 anion column,12 mM KOH (Eluent generator) eluent, under the recommended chromatographic conditions, the chromatogram is as follows. This method is widely used in the determination of anion in circuit boards (IPC-TM-650 2.3.28) .

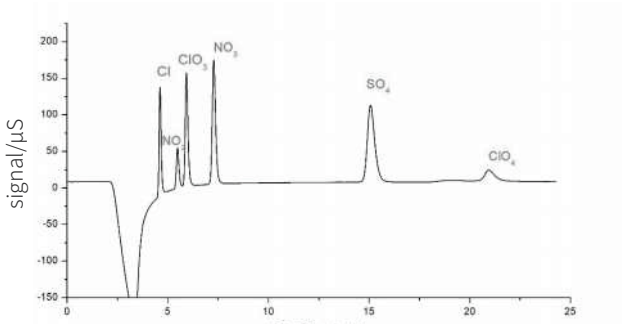




Ⅷ. Application of Ion Chromatography in The Analysis of Public Security Systems

Explosive analysis

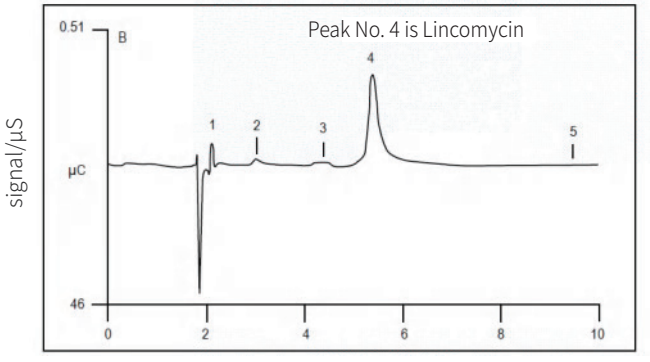
In order to detect chlorate in ammonium nitrate explosive, the soil sample after explosion was extracted by water oscillation,then taking supernatant after centrifugation, filtered by IC-RP column and 0.22 um microporous filtration membrane.Using CIC-D150 ion chromatograph, SH-AC-12B anion column, 4.0 mM Na_2CO_3 eluent and bipolar pulse conductance method, under the recommended chromatographic conditions, the chromatogram is as follows.



IX.Application of Ion Chromatography in Pharmaceutical Analysis

Antibiotic analysis

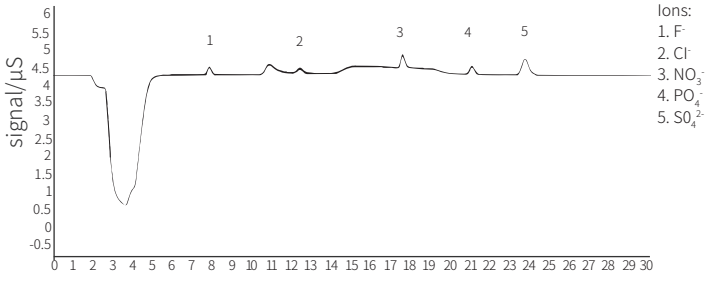
In order to determine lincomycin in drugs, samples were extracted by water oscillation , then taking supernatant after centrifuged and filtered by 0.22 microporous membrane. Using CIC-D150 ion chromatograph and SH-AC-3 anion column,3.6 mM Na_2CO_3+4.5 mM $NaHCO_3$ eluent and bipolar pulse conductance method, under the recommended chromatographic conditions, the chromatogram is as follows.



X.Application of Ion Chromatography in Nuclear Power

Anions in boric acid

Using CIC-D300+ ion chromatograph,SH-AP-3 anion column , KOH (Gradient Eluent) eluent and , 2000 μL large sample loop.Under the recommended chromatographic conditions,the chromatogram is as follows.



Standard Number	Title of Standard
US EPA 300.0	Determination of inorganic anions:F^-, Cl^-, NO_2^-, Br^-, NO_3^-, $H_2PO_4^-$, SO_4^- ,ClO_2^-, BrO_3^-, ClO_3^-.
US EPA 300.1	Determination of inorganic anions in drinking water F^-, Cl^-, NO_2^-, Br^-, NO_3^-, $H_2PO_4^-$, SO_4^- ,:ClO_2^-, BrO_3^-, ClO_3^-.
US EPA 302.0	Determination of BrO_3^- in drinking water using two-dimensional ion chromatography with suppressed conductivity detection.
US EPA 314.0	Determination of ClO_4^-. in drinking water using ion chromatography with suppressed conductivity detection.
US EPA 321.8	Determination of BrO_3^- in drinking waters by ion chromatography(IC) inductively coupled plasma - mass spectrometry(ICP-MS).
US EPA 1636	Determination of Cr（VI） by ion chromatography.
US EPA 6860	ClO_4^-in water soils and solid wastes using ion chromatography-electrospray ionization-mass spectrometry (IC-ESI-MS or IC-ESI-MS-MS).
US EPA 9056	Determination of inorganic anions by ion chromatography：F^-, Cl^-, NO_2^-, Br^-, NO_3^-, PO_4^-, SO_4^- ,:
US EPA 9058	Determination of ClO_4^- using ion chromatography with chemical suppression conductivity detection.
US EPA 332.0	Determination of ClO_4^- in drinking water by ion chromatography with suppressed conductivity and electrospray ionization-mass spectrometry(IC-EIMS).
US EPA 314.0	Determination of perchlorate in drinking Water
AOAC Official Method 2001.02	Determination of trans-Galactooligosaccharides.(TGOS) in selected food products.
AOAC Official Method 2012.20	Choline in infant formula and adult nutritionals.
AOAC Official Method 995.13	Carbohydrates in soluble (instant) coffee.
AOAC Official Method 996.04	Sugars in cane and beet final molasses.
AOAC Official Method 997.08	Fructans in food products.
AOAC Official Method 2000.11	Polydextrose in foods.
ASTM D5794 – 95 (Reapproved 2008)	Determination of anions in cathodic electrocoat permeates by ion chromatography.
ASTM D2036 – 09	Standard test methods for cyanides in water.
ASTM D 6832 – 08	Determination of hexavalent chromium in workplace air by ion chromatography and spectrophotometric measurement using 1,5-diphenylcarbazide.
ASTM D6919-09	Determination of dissolved alkali and alkaline earth cations(Li^+, Na^+, NH_4^+, K^+, Mg^{2+}, Ca^{2+}) and ammonium in water and wastewater.
IPC-TM-650 2.3.28	Ionic analysis of circuit boards

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E-mail：inquiry@qdsrd.com
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