SHINE 盛瀚

ION CHROMATOGRAPH

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SHINE 盛瀚

TECHNICAL SUPPORT SERVICES

We are committed to providing you with comprehensive and professional support, services and information. We promise to provide lifetime service before, during and after the use period of the instrument.

SHINE PROVIDES

Sample testing and application consulting service;

On-site installation and commissioning;

Professional maintenance contract and maintenance service;

Instrument operation training;

Free software upgrade;

Real-time technical support through video, telephone or e-mail;

Localization services by cooperating with local distributors .

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ION CHROMATOGRAPHY

OUR MISSON

MAKING EFFORTS TO LABEL CHINESE SCIENTIFIC INSTRUMENTS AS TOP-CLASS, COME TOWARDS THE WORLD AND SERVICE GLOBALLY.

About us

Qingdao Shenghan Chromatograph Technology Co., Ltd.(SHINE) is a high-tech enterprise specializing in R&D, production, sales and after-sales service of ion chromatograph and relevant parts. Established in 2002,SHINE has provided perfect solutions for more than 4000 users of different industries so far.

As the largest R & D and manufacturing enterprise of ion chromatograph in China, the members of our R&D team account for more than 40% of total employees, and those with master or doctor account for more than 70% of the team. In this team,Zhang Liesheng and Jing Jianzeng senior engineers developed the first generation ion chromatograph (ZIC-3) in China.The R & D team undertook more than ten national and municipal projects including National Major Scientific Instrument and Equipment Development Projects in 2012, 2013 and 2016, and participated in the formulation of national standards related to ion chromatography in China.

Now we have 3 series of ion chromatograph: laboratory IC, portable IC and on-line IC.It basically satisfies the routine and trace detection of anion and cation, cyanide, iodide, sugar, small molecule organic acid and so on.Our products are widely used in environmental protection, hydrogeology, petroleum, chemical, food, pharmacy, health and epidemic prevention, electrical and electronic,scientific research and many other industries.In addition, SHINE is the only company in China that can achieve mass production of ion chromatographic columns.

The core components are independently developed and produced by us. The annual capacity of the instrument is 2000 units, the annual capacity of the conductivity cells and suppressors is 4000 units, and the annual capacity of pretreatment columns is 30,000 units . In addition, we have an independent workshop for chromatographic columns with an annual capacity of more than 10000 columns.

In 2018,we become the National Manufacturing Individual Champion Cultivate Enterprises.

SHINE is not only able to provide high-quality products, but also dedicated to providing comprehensive and professional support, services and information for customers. We promise to provide lifetime service before, during and after the use of the instrument. Including sample testing and application consulting services, on-site installation, commissioning, professional maintenance services,instrument operation training ,free software upgrades and we cooperate with local distributors to provide localization services.

SHINE sales network covers all provinces, autonomous regions ,municipalities (including Hong Kong, Macao and Taiwan) in China and exported to more than 30 overseas countries and regions such as Belarus, South Korea and India etc.tion services.

Through rapid development, the company rank the first in the domestic industry in terms of enterprise size, R&D strength and market share, and has become a leading provider of overall solutions for ion chromatography.

OUR HONOR

Shandong Science and Technology Award

Qingdao Science and Technology Award

Qingdao IC Expert Workstation

The Hidden Champion of Qingdao Industrial Enterprises

Individual Champion of Manufacturing Industry in Shandong

National Key New Products

CERTIFICATION

Quality/Environmental / Occupational Health and Safety Management System Certification

CE certification

Invention Patent
*8

Industrial Design Patent
*14

Utility Model Patents
*19

Software Copyright
*15

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 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.

Our company now have three series of ion chromatograph: laboratory IC, portable IC and on-line IC.

The new D-series laboratory IC have been greatly improved in instrument stability, intelligence, convenience, functional diversity, and 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 portable, on-site and rapid detection.

On-line water quality IC and On-line atmospheric 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.

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.

Laboratory IC

Portable IC

On-line IC

OEM Product

It is a high-stability ion chromatograph with simple structure. The analysis of anion, cation, cyanide, iodide ,sugar and small molecule organic acid can be realized by combining with conductivity detector and amperometric detector. It is widely used in the fields of environmental protection, disease control, chemical industry, hydrology, mining and metallurgy.

Technology Advantage:

- **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 of the columns,satisfying the detection of various ion;
- **Self-regenerating electrolytic micro-membrane suppressor (CN 102735792A)**
  High pressure resistance, small dead volume, highly responsive to signals;
- **Temperature-control pentode conductivity detector**
  Intelligent temperature control to ensure better accuracy of analysis;
- **Observatory intelligent workstation**
  Integrated control, compatibility for a variety of instruments and customized images.

Technical Parameter:

Pump
Maximum Pressure:42MPa(Stainless steel)
Flow Rate Range:0.001~9.999mL/min

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

Column Heater
Operating Temperature Range: 20 ~60°C(68~140°F)
Temperature Accuracy: ±0.01°C
Temperature Stability: ≤1°C/h

Conductivity Detector
Cell Volume: ≤0.8μL
Detection Range:0~35000μS/cm
Baseline Noise: ≤0.05%FS
Baseline Drift: ≤3%FS/30min

Power Requirements: 150W
Dimensions(L*W*H*): 325*400*500 (mm)
Net Weight(KGS): 21
Gross Weight(KGS):28

CIC-D100

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 third-party testing institutions, enterprises, environmental protection, chemical industry, mining and metallurgy and other fields.

Technology Advantage:

- **Auto-range Conductivity Detector**
  It can directly detect the signal from ppb to ppm concentration without adjusting the range;
- **Eluate preheating**
  By keeping the temperature of the eluate 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(Stainless steel)
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 ,satisfying the detection of various ion;
- **Self-regenerating electrolytic micro-membrane suppressor (CN 102735792A)**
  High pressure resistance, small dead volume and highly responsive to signals;
- **Observatory intelligent workstation**
  Integrated control, compatibility for a variety of instruments, customized images.

Technical Parameter:

Pump

Maximum Pressure: 35MPa
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

CIC-D150

CIC-D150 ion chromatograph is located in 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 of 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 separate the bubble from the eluent;
- By timing startup and preheating function to set the start-up and all parameter 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:35MPa(PEEK)
Pressure Display Accuracy:≤0.1MPa
Flow Rate Range:0.001~9.999mL/min

Injector

Maximum Pressure:35MPa(PEEK)

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 upgrade 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**
  High pressure resistance, small dead volume, highly responsive to signals;
- **Built-in low-pressure degassing technology to eliminate bubble interference for stability**
  High pressure resistance, small dead volume, highly responsive to signals;
- **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	Conductivity Detector	Built-in Eluent Generator
Maximum Pressure: 35 MPa(PEEK)	Cell Volume: ≤0.8μL	Eluent Types : KOH/NaOH
Pressure Display Accuracy: ≤0.1MPa	Detection Range: 0~50000μS/cm	Eluent Concentration Range :0.1-100mM
Flow Rate Range:0.001~9.999mL/min	Detection Resolution:≤0.0020nS/cm	Concentration Increment :0.1mM
	Electronic Noise:0.02nS	Flow Rate Range:0.1-3.0mL/min
Power Requirements:150W	Temperature Range:	Pressure:5MPa-20MPa
Dimensions(L*W*H*):350*470*650 (mm)	Room temperature+5~60°C(41 ~140°F)	
Net Weight(KGS):34	Maximum Pressure:10.0MPa	
Gross Weight(KGS): 40		

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: 35 MPa(PEEK)
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: 0.1-3.0mL/min
Pressure:5MPa-20MPa

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

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: 35MPa(PEEK)
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

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

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

SH-GIC7000 Atmosphere On-line 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 workstation, 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 Water Quality On-line Ion Chromatograph

SH-WIC5000 is a full-automatic and intelligent water quality on-line 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 water quality on-line 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 workstation, 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	Application Fields
SH-AC-1	4.6*250	Carbonate system;A basic column, can simultaneously analyze 6 kinds of common anions: Cl^-, NO_2^-, Br^-, NO_3^-, $H_2PO_4^-$, SO_4^{2-} .	Suitable for common anions detection in environmental protection, cement and other fields.
SH-AC-3	4.0*250	Carbonate system;Simultaneously analyzing 7 kinds of common anions: 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.	Disease control, food, environmental protection, metallurgy, geology and other industries, especially for oxyhalogenate analysis.
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.	Disease control, food, environmental protection, metallurgy, geology and other industries.
SH-AC-5	4.6*250	Hydroxide system;Simultaneously analyzing 7 kinds of common anions and some organic acids such as citric acid. (The negative peaks of water and F- peaks are well separated.)	Environmental protection, metallurgy, food and other industries.
SH-AC-6	4.6*200	Carbonate system;A hydrophobic anion column mainly used for anion analysis in nitric acid digestion samples and analyzing samples containing large amounts of NO_3^-.	Anion analysis in nitric acid digestion samples,such as cement samples.
SH-AC-7	4.0*150	Carbonate system;A rapid analysis column,can simultaneously analyze 6 kinds of common anions: Cl^-, NO_2^-, Br^-, NO_3^-, $H_2PO_4^-$, SO_4^{2-} within 6 minutes.	Logging and other industries requiring rapid analysis.
SH-AC-8	4.6*250	Carbonate system;A bromate rapid analysis column for analyzing 7 kinds of anions within 12 minutes: Cl^-, NO_2^-, BrO_3^- (wheat flour) , Br^-, NO_3^-, $H_2PO_4^-$, SO_4^{2-}.	Food, environmental protection, metallurgy, geology and other industries.
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.	Environmental protection, metallurgy and other industries.
SH-AC-11	4.6*250	Hydroxide system;A bromate analysis column, can simultaneously analyze 7 kinds of common anions and disinfection by-products of drinking water :ClO_2^-, BrO_3^-, ClO_3^-, DCA , TCA .	Drinking natural mineral water, packaged drinking water, drinking water and other industries.
SH-AC-12B	3.0*250	Carbonate system;Simultaneously analyzing 7 kinds of common anions and disinfection by-products of drinking water:ClO_2^-, BrO_3^-, ClO_3^-, DCA , TCA.The tailor-made microbore column can save eluent and improve response value.	Drinking natural mineral water, packaged drinking water, drinking water and other industries.
SH-AC-12A	3.0*250	Hydroxide system;Simultaneously analyzing 7 kinds of common anions and disinfection by-products of drinking water:ClO_2^-, BrO_3^-, ClO_3^-, DCA , TCA.The tailor-made microbore column can save eluent and improve response value.	Power plant water, drinking natural mineral water, packaged drinking water, drinking water and other industries.
SH-AC-14	4.6*150	Carbonate / acetic acid system;A special column for S^{2-} and CN^- analysis (specially developed for amperometric detector).	The identification of hazardous waste leaching toxicity.
SH-AC-15	4.6*200	Hydroxide system;Analyzing azide, nitrate and bromate ion by suppression conductance method .	The detection of azide residues in the production of chemicals.
SH-AC-16	4.6*250	Hydroxide system;A special column for polyphosphate analysis.	The detection of 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^-, $S_2O_3^-$.	Environmental protection, water quality and other industries.
SH-AC-18	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 detection of $H_2PO_4^-$
SH-AC-19	2.1*200	Hydroxide system;With fine diameter, low flow rate, high signal response value,it can simultaneously analyze7 kinds of common anions and BrO_3^- .	Trace analysis of natural mineral drinking water, packaged drinking water and domestic drinking water.

Anion Ion Chromatographic Columns(stainless steel)

Model	Specification (mm)	Function	Application Fields
SH-AC-20	2.1*200	Carbonate system；With fine diameter, low flow rate, high signal response value,it can simultaneously analyze 7 kinds of common anions and BrO_3^-.	Trace analysis of natural mineral drinking water, packaged drinking water and domestic drinking water.
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	Application Fields
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 and some disinfection by-products.	Drinking natural mineral water, packaged drinking water, drinking water and other industries.
SH-AP-2	4.0*250	Carbonate system;With alkyl quaternary amine exchange group, it can analysis 7 kinds of common anions and some disinfection by-products.	Disease control, food, environmental protection, metallurgy, geology and other industries
SH-AP-3	4.0*150	Carbonate system；With alkyl quaternary amine matrix , it can analysis 7 kinds of common anions.	industries requiring rapid analysis.
SH-GP-1	4.6*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.
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

Model	Specification (mm)	Function	Application Fields
SH-CC-1	4.6*150	Oxalic acid/ ethylenediamine system;Rapidly separating alkaline earth metal cations,such as Mg^{2+}, Ca^{2+} within 2 minutes;Rapidly separating Mg^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+} within 5 minutes; And it can also analyze choline chloride in milk powder.	Environmental protection, mineral water, medical examination, milk powder, feed and other industries.
SH-CC-2	4.6*250	Oxalic acid / ethylenediamine system;A special column for metal ion analysis such as Zn^{2+}, Fe^{2+}, Mn^{2+}, Mg^{2+}, Ca^{2+} by non-suppression conductivity method.	Mainly used for the detection of Mn/Zn.
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+}.	Environmental protection, water quality, medical treatment, food and other industries.
SH-CC-4	4.0*200	MSA system；Polymer matrix weak acid cation column,can analyze 6 kinds of common cations：Li^+, Na^+, NH^{4+}, K^+, Mg^{2+}, Ca^{2+}.High organic solvent tolerance。	Environmental protection, water quality, medical , food and other industries.
SH-CC-5	——	Cation column;A special column for heavy metal ion analysis such as zinc, iron, manganese, cadmium, cobalt, nickel, copper and lead with UV-Vis detector.	Post-column derivation special column for metal ion.

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 reduce the background conductance, improve the sensitivity of ions to be measured, and make 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 eluent generator can realize the function of generating the required concentration of eluent on-line only by adding pure water , eliminate the time-consuming operation of manual preparation of eluent, greatly improve the automation degree of analysis and avoid the test error caused by human factors. At the same time, the intelligent control method can realize the self-defined setting of the concentration , the gradient elution and separation operation of complex samples which can not be completed by the equivalent pump, which further improves the accuracy of the analysis.

Autosampler

SHA-7 Single channel

SHA-12 /SHA-15 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-D160 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 micro-porous filter membrane and treated by IC-RP column. Using CIC-D160 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-D120 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. Detection of halogenated acetic acid in drinking water

Samples are filtered by sand core filter. Using CIC-D120 ion chromatograph, SH-AC-3 anion chromatographic column, 2.4mM Na_2CO_3/3.6mM $NaHCO_3$ eluent and bipolar pulse conductance method,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-D120 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-D120 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-D120 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-D120 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-D120 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 Metallurgical Ore Analysis

1. Plating solution

According to the replacement of low boiling acid by high boiling acid, F^- and Cl^- are distilled together with sulfuric acid as distillation agent at a certain temperature for separation and enrichment. Using CIC-D120 ion chromatograph , SH-AC-3 anion columns. 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.

The detection limits of F^- and Cl^- are 0.84ug/L and 0.37 ug/L. The recoveries of F^- and Cl^- are 91%-107% and 95%-105%(n=10). The coexisting ions in the plating solution had no interference with the determination of F^- and Cl^-.

2. Iron ore

After ultrasonic extraction and centrifuge separation and precipitation, iron ore samples were filtered by IC-RP column, IC-Na column and 0.22 um microporous filtration membrane respectively. Using CIC-D120 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.

The detection limits of F^- and Cl^- are 2.1 ug/g and 3.5 ug/g. The recoveries of F^- and Cl^- are 96%-104%. It can be used for the analysis of natural iron ore, iron ore concentrate and other samples.

VI. Application of Ion Chromatography in Halogen Analysis

Using oxygen bomb combustion method to detect the halogen content in printed circuit boards. In the airtight oxygen bomb combustion chamber, the samples to be measured were fully burned and absorbed by the absorbed liquid. Using CIC-D120 ion chromatograph, SH-AC-9 anion column, 1.8 mM Na_2CO_3+1.7 mM $NaHCO_3$ eluent and bipolar pulse conductance method, under the recommended chromatographic conditions, the chromatogram is as follows. Ion chromatography can be used for halogen analysis in loudspeaker base, tympanic membrane, power and communication cable, connector, PCB board and other electronic products.

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

Using oxygen bomb combustion method to realize the quantitative analysis and detection of halogen in color masterbatch. In the airtight oxygen bomb combustion chamber, the sample to be measured was fully burned and absorbed by the absorbed liquid. Using CIC-D120 ion chromatograph, SH-AC-3 anion column,4.0 mM Na_2CO_3+2.7 mM $NaHCO_3$ eluent and bipolar pulse conductance method, under the recommended chromatographic conditions,the chromatogram is as follows. This method is widely used in the determination of halogen content in rubber, fibers, plastics and other macromolecule materials.

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-D120 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-D120 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.

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^{2-} , 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^{2-} , 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^{2-} , SO_4^{2-} .
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).
AOAC Official Method 2012.20	Choline in infant formula and adult nutritionals.
ASTM D2036 – 09	Standard test methods for cyanides in water.
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.

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SHINE sales network covers all provinces, autonomous regions ,municipalities (including Hong Kong, Macao and Taiwan) in China and exported to more than 20 overseas countries and regions such as Belarus, South Korea and India etc. Excellent product quality, professional sales team and perfect after-sales service have won the trust of domestic and foreign customers.

GLOBAL SALES NETWORK

Qingdao Shenghan Chromatograph Technology Co., Ltd. is committed to creating comprehensive, professional and reliable ion chromatography products, working hard to improve the ecological environment and enhance human health, using the power of technology and civilization to change the future.