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## 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.

## SHENGHAN 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 .



<http://en.sheng-han.com>

**QINGDAO SHENGHAN CHROMATOGRAPH  
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**SHINE** 盛瀚

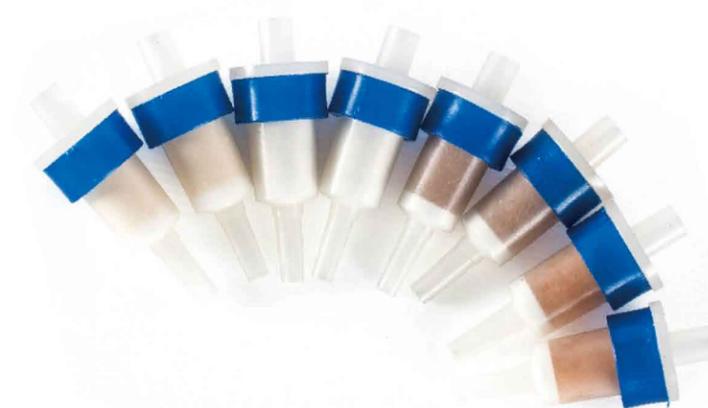
**ION** QINGDAO SHENGHAN  
CHROMATOGRAPH  
TECHNOLOGY CO., LTD.

# CHROMATOGRAPHY CONSUMABLES

Qingdao Shenghan Chromatograph Technology Co., Ltd is a technology service company providing ion chromatography technology. Focusing on customers, market-oriented, technology-driven, Shenghan commits to providing customers with comprehensive technical services.

Technological strength is the lifeline of an enterprise. Shenghan has continuously increased its R&D investment, investing no less than 10% of its annual sales in R&D and undertook "The National Major Scientific Equipment Development Projects" in 2012, 2013 and 2016, in which made a series of breakthroughs. The ion chromatographic column has reached the international leading level. SH chromatographic column is one of the two major OH<sup>-</sup> system chromatographic columns in the world.

At present, Shenghan has a comprehensive range of ion chromatography related products, including ion chromatographic column, general components, sample pretreatment equipment and other consumables. We provide one-stop service of ion chromatography to make your work simpler, the operation of ion chromatography system more reliable and the analysis results more accurate.



- 07-Common anion chromatographic column
- 10-Special anion chromatographic column
- 12-Universal cation chromatographic column

**PART 1**   
**ION CHROMATOGRAPHIC COLUMN**

- 15-Automatic sampler
- 16-Six-way injection valve
- 17-Eluent generator
- 17-Capture column
- 18-Infusion pump
- 19-High pressure eluent unit
- 19-On-line degassing device
- 19-Column switching device

**PART 3**   
**FUNCTIONAL COMPONENTS**

- 24-Universal consumables

**Part 5**   
**UNIVERSAL CONSUMABLES**

- 13-Conductivity detector
- 13-Amperometric detector
- 13-UV detector
- 14-Suppressor

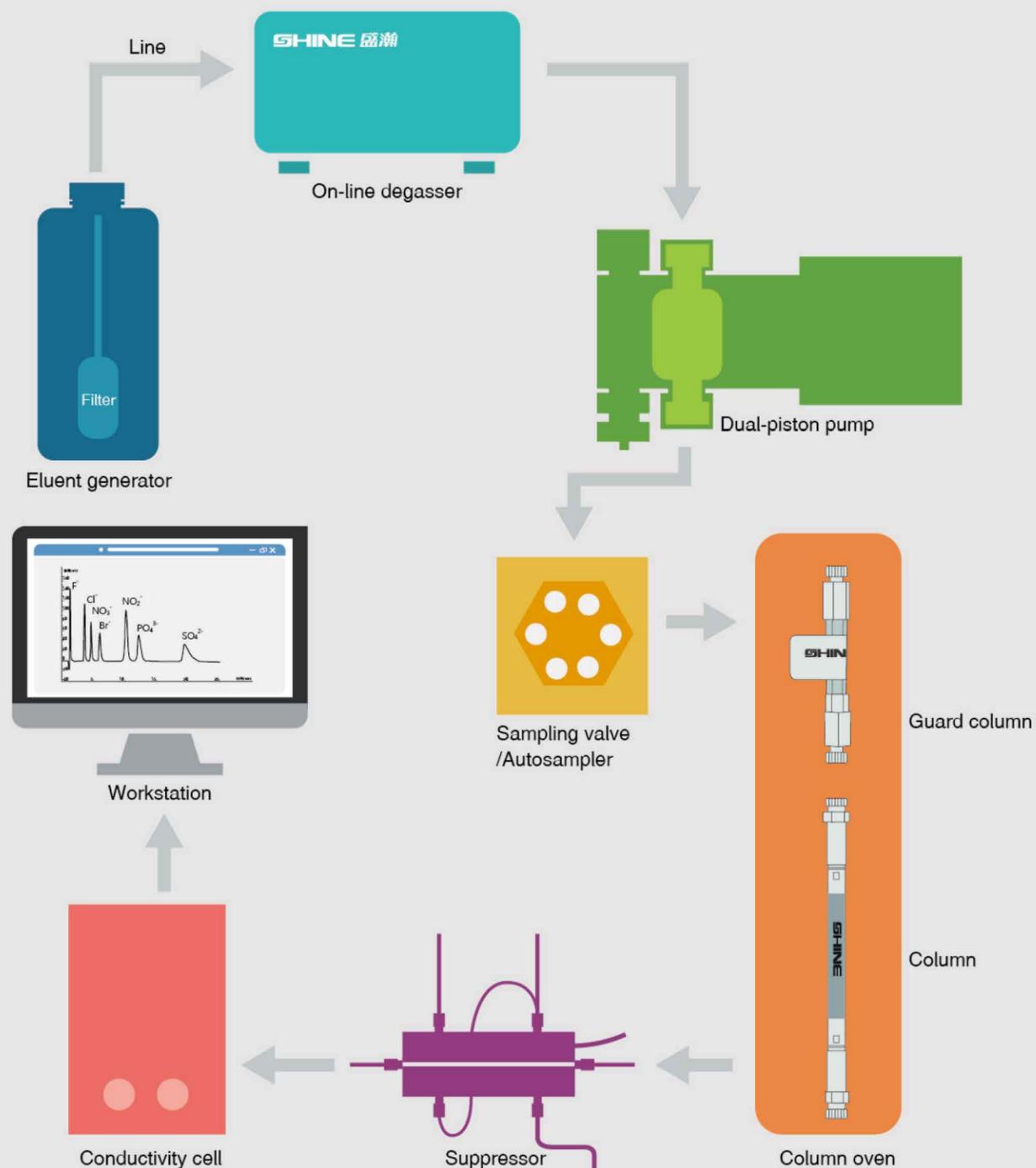
**PART 2**   
**DETECTION UNIT**

- 20-SH series pretreatment column
- 21-Needle filter
- 21-Oxygen bomb combustion sample processing device
- 22-Tube furnace
- 22-Sand core filtration device
- 23-Automatic filter unit
- 23-Solid phase micro-extraction

**PART 4**   
**SAMPLE PRETREATMENT**



You can purchase products through this manual.



**IC COLUMN**

THE ONLY COMPANY IN CHINA THAT CAN BE ADOPTED IN MASS-PRODUCE OF ION CHROMATOGRAPHIC COLUMNS

**THE ONLY COMPANY IN CHINA THAT CAN BE ADOPTED IN MASS-PRODUCE OF ION CHROMATOGRAPHIC COLUMNS**

Qingdao Shenghan Chromatograph Technology Co., Ltd. has been developing ion chromatographic column since 2008. As the only enterprise in China, it can realize mass production of IC column. Professional R&D team and advanced production technology ensure that you can get IC column with good reproducibility and separation effect at any time. At present, the excellent performance of Shenghan SH series columns can provide different choices for users' daily detection and method development, and can reduce users' operation and maintenance costs by about 35%.

Shenghan is the second company in the world that has successfully developed and mass-produced hydroxide system columns, breaking the monopoly of imported brands for more than ten years.

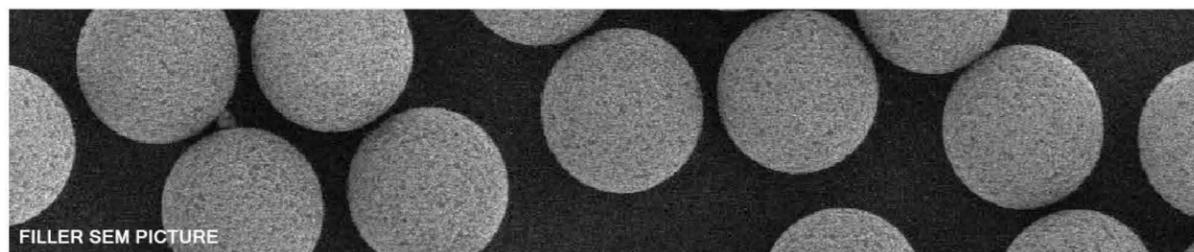
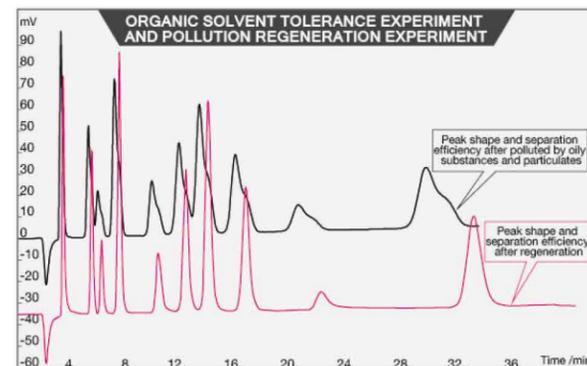
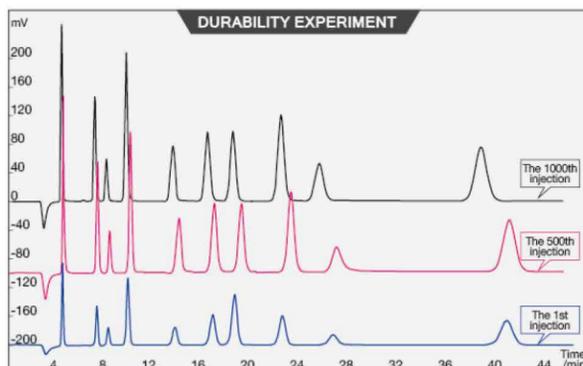
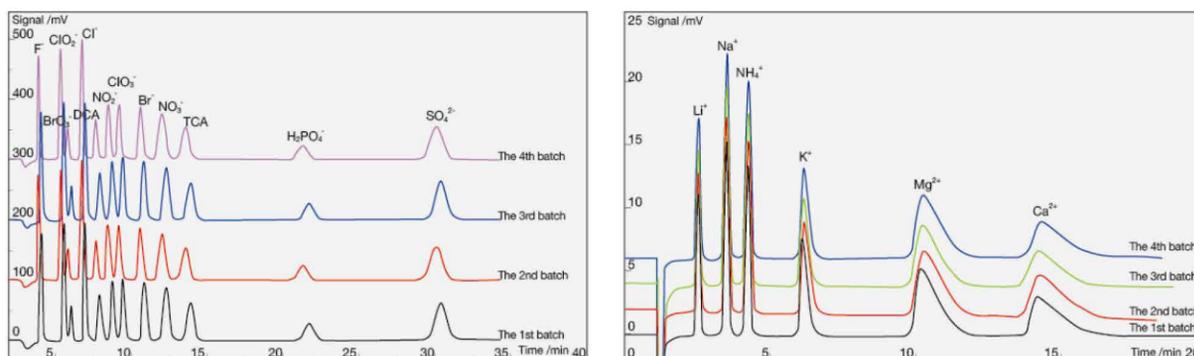
SH series columns using polymer-based spheres as matrix, our company's unique stationary phase bonding technology and polymer-based sphere surface treatment technology. The peak shape, separation, stability and reproducibility of SH series chromatographic columns are excellent.

## SH SERIES ION CHROMATOGRAPHIC COLUMN

### THE MOST UNIVERSAL CHROMATOGRAPHIC COLUMN /

- > The first choice for developing or improving IC methods;
- > Excellent performance and stable polymer stationary phase;
- > Complete batch tracking and reproducibility;
- > The only mass-produced IC column in China;
- > It has wide applicability and can be widely applied to domestic and imported brand IC.

### EXCELLENT BATCH REPRODUCIBILITY /



FILLER SEM PICTURE



### COLUMN DETAILS PICTURE

#### HARDWARE /

- > Very low diffusion hardware;
- > Innovative technic of sieve plate.

#### FILLER /

- > High mechanical strength particles;
- > Advanced particle Sieving Technology;
- > Selectivity between batches remains stable;
- > Innovation of porous base ball manufacturing technology to provide super high exchange capacity;
- > Unique surface treatment technology for packing.



#### PRODUCTION TECHNIC /

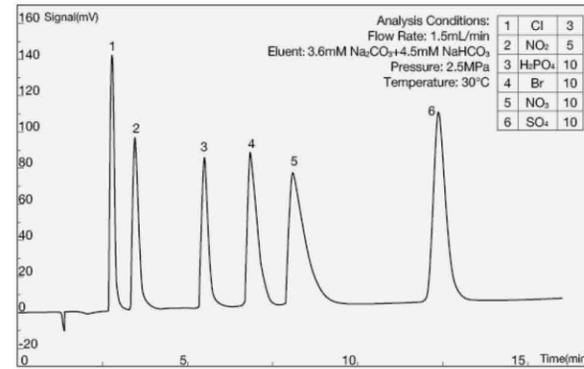
- > The mechanical stability and pressure resistance of the column bed are up to 300 bar;
- > Advanced packing technology and equipment for column.



## COMMON ANION COLUMNS

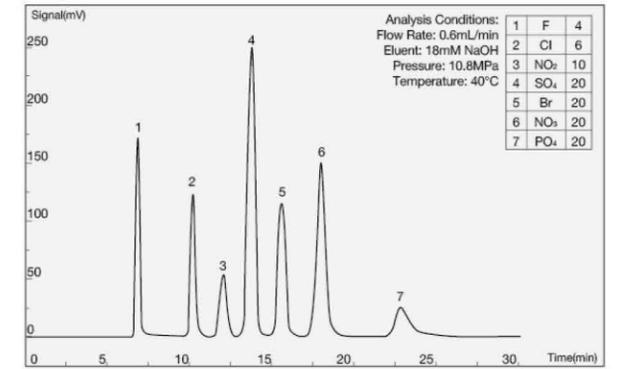
### SH-AC-1 COLUMN/ 4.6\*250MM/

> A basic anion column, using carbonate system eluent, can simultaneously analyze 6 kinds of common anions:  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ ,  $\text{H}_2\text{PO}_4^-$ ,  $\text{SO}_4^{2-}$ . With fast analysis speed and high cost performance, it is suitable for environmental protection, cement and other industries.



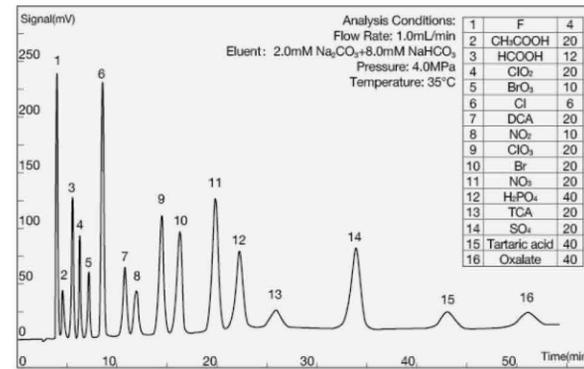
### SH-AC-5 COLUMN/ 4.6\*250MM/

> An anion column with high hydrophilicity, using hydroxide system eluent, can simultaneously analyze 7 kinds of common anions:  $\text{F}^-$ ,  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ ,  $\text{PO}_4^{3-}$ ,  $\text{SO}_4^{2-}$ . With good separation of water negative peak and the  $\text{F}^-$  peak, it is suitable for environment, metallurgy and other industries.



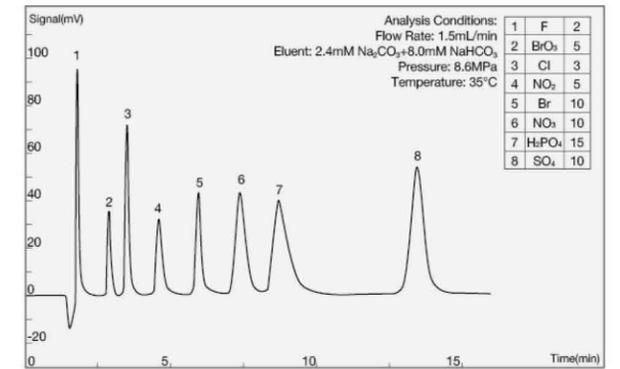
### SH-AC-3 COLUMN/ 4.0\*250MM/

> An anion column with high efficiency, using carbonate system eluent. It can simultaneously analyze 7 kinds of common anions ( $\text{F}^-$ ,  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ ,  $\text{H}_2\text{PO}_4^-$ ,  $\text{SO}_4^{2-}$ ), disinfection by-products ( $\text{BrO}_3^-$ ,  $\text{ClO}_2^-$ ,  $\text{ClO}_3^-$ , dichloroacetic acid DCA, trichloroacetic acid TCA) and other anions, especially for the analysis of halogenates containing oxygen and is suitable for various industries such as disease control, food, environment, metallurgy, geology and so on.



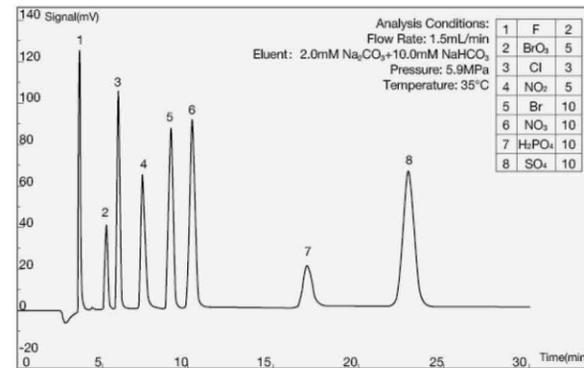
### SH-AC-8 COLUMN/ 4.6\*250MM/

> A rapid analysis anion column (< 5 min) for  $\text{BrO}_3^-$ , using carbonate system eluent. It is suitable for food, environment, metallurgy, geology and other industries.



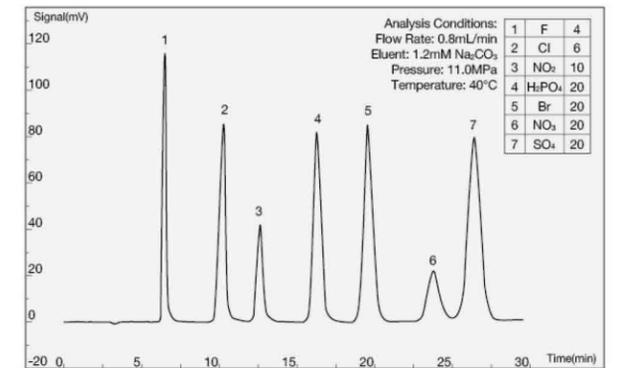
### SH-AC-4 COLUMN/ 4.6\*250MM/

> A universal anion column, using carbonate system eluent, can simultaneously analyze  $\text{F}^-$ ,  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ ,  $\text{H}_2\text{PO}_4^-$ ,  $\text{SO}_3^{2-}$ ,  $\text{SO}_4^{2-}$ ,  $\text{BrO}_3^-$ . With low pressure and fast analysis speed, it is suitable for food, environment, metallurgy, geology and other industries.



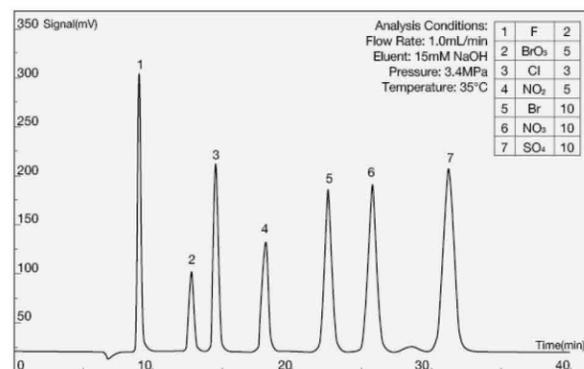
### SH-AC-9 COLUMN/ 4.6\*250MM/

> A hydrophilic anion column, using carbonate system eluent, can simultaneously analyze 7 kinds common anions:  $\text{F}^-$ ,  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ ,  $\text{H}_2\text{PO}_4^-$ ,  $\text{SO}_4^{2-}$ . With good separation of water negative peak and the  $\text{F}^-$  peak, it is suitable for electronic and electrical, petrochemical, environmental, metallurgical and other industries.



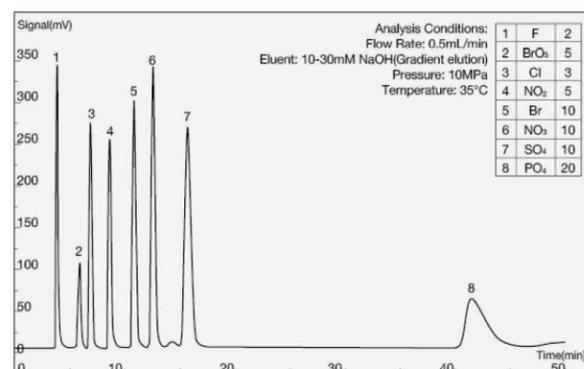
### SH-AC-11 COLUMN /4.6\*250MM /

> An anion column with high efficiency, using hydroxide system eluent. It can simultaneously analyze 7 kinds of common anions ( F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>, NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>, PO<sub>4</sub><sup>3-</sup>, SO<sub>4</sub><sup>2-</sup>), disinfection by-products ( BrO<sub>3</sub><sup>-</sup>, ClO<sub>2</sub><sup>-</sup>, ClO<sub>3</sub><sup>-</sup>, dichloroacetic acid DCA, trichloroacetic acid TCA ) and other anions. With good peak shape, gradient elution, higher sensitivity and wider application scope, it is suitable for drinking natural mineral water, packaging drinking water, drinking water and other industries.



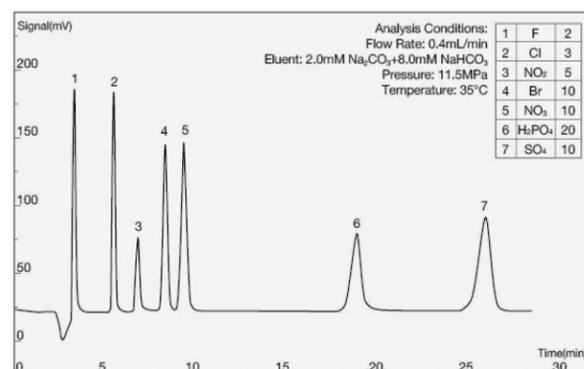
### SH-AC-12A COLUMN /3.0\*250MM /

> A microbore anion column, using hydroxide system eluent. It can simultaneously analyze 7 kinds of common anions ( F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>, NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>, PO<sub>4</sub><sup>3-</sup>, SO<sub>4</sub><sup>2-</sup>), disinfection by-products ( BrO<sub>3</sub><sup>-</sup>, ClO<sub>2</sub><sup>-</sup>, ClO<sub>3</sub><sup>-</sup>, DCA, TCA ) and other anions. With fine diameter, low flow rate, high signal response value, gradient elution, it is suitable for trace analysis of power plant water, natural mineral drinking water, packaged drinking water and domestic drinking water.



### SH-AC-12B COLUMN /3.0\*250MM /

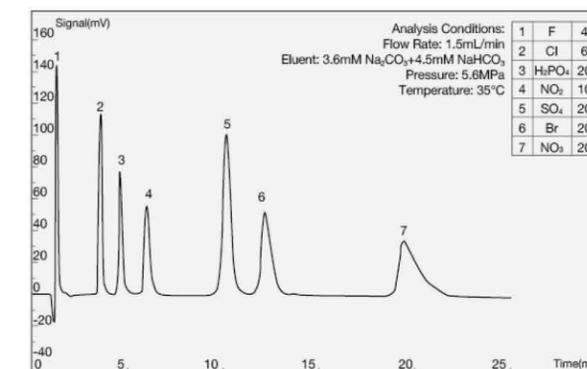
> A microbore anion column, using carbonate system eluent, it can simultaneously analyze 7 kinds of common anions ( F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>, NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>, PO<sub>4</sub><sup>3-</sup>, SO<sub>4</sub><sup>2-</sup>), disinfection by-products ( BrO<sub>3</sub><sup>-</sup>, ClO<sub>2</sub><sup>-</sup>, ClO<sub>3</sub><sup>-</sup>, DCA, TCA ) and other anions. With fine diameter, low flow rate, high signal response value, it is suitable for trace analysis of natural mineral drinking water, packaged drinking water and domestic drinking water.



## SPECIAL ANION COLUMN

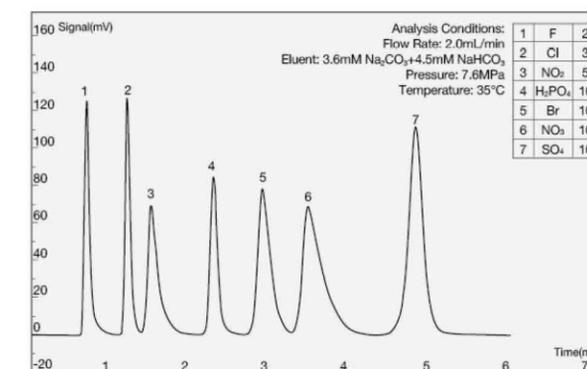
### SH-AC-6 COLUMN /4.6\*200MM /

> A special anion column for nitric acid digestion sample, using carbonate system eluent, can simultaneously analyze common anion samples containing large amounts of NO<sub>3</sub><sup>-</sup>. With a long retention time of NO<sub>3</sub><sup>-</sup>, it prevents other ions from interfering with high concentrations of NO<sub>3</sub><sup>-</sup>, it is suitable for analysis of nitric acid digestion samples in cement industry.



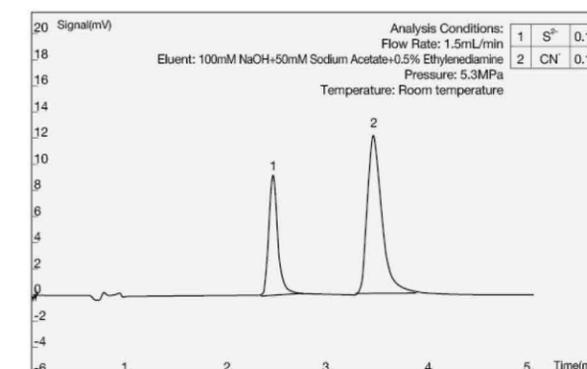
### SH-AC-7 COLUMN /4.0\*150MM /

> A rapid analysis anion column, using carbonate system eluent, can analyze 6 kinds of common anions ( Cl<sup>-</sup>, Br<sup>-</sup>, NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>, H<sub>2</sub>PO<sub>4</sub><sup>-</sup>, SO<sub>4</sub><sup>2-</sup> ) within 5 minutes. It is suitable for logging and other industries requiring rapid analysis.



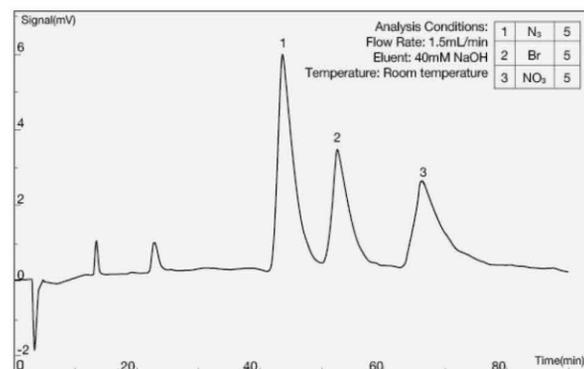
### SH-AC-14 COLUMN /4.6\*150MM /

> A special anion column for S<sup>2-</sup>, CN<sup>-</sup>, combined with amperometric detector, is mainly used for toxicity identification of hazardous waste leaching.



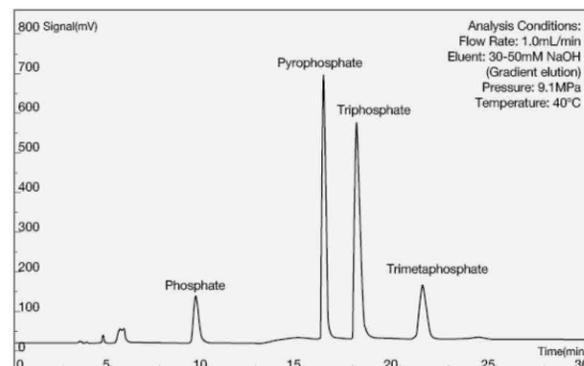
**SH-AC-15 COLUMN /4.6\*200MM /**

> A special anion column for azide,  $\text{NO}_3^-$  and  $\text{BrO}_3^-$ , using hydroxide system eluent. It is mainly used to analyze azide residues in pharmaceutical industry.



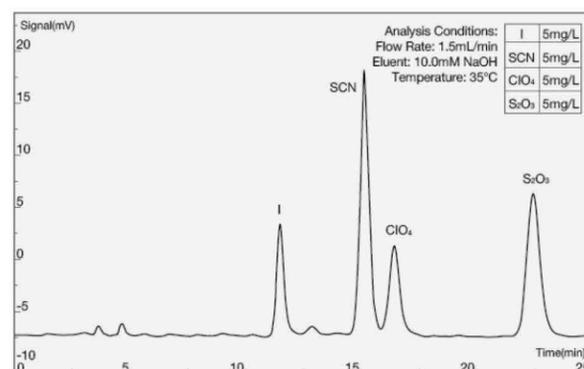
**SH-AC-16 COLUMN /4.6\*250MM /**

> A special anion column for polyphosphates, using hydroxide system eluent, mainly used to analyze polyphosphates in aquatic products.



**SH-AC-17 COLUMN /4.6\*250MM /**

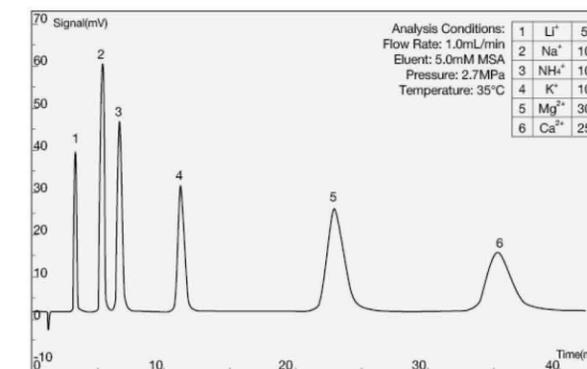
> A special anion column for  $\text{I}^-$  with conductivity method, using hydroxide system eluent. It is mainly applicable to the analysis of  $\text{I}^-$ ,  $\text{SCN}^-$  and  $\text{S}_2\text{O}_3^{2-}$  in the environment, solid waste and other industries.



**UNIVERSAL CATION CHROMATOGRAPHIC COLUMN**

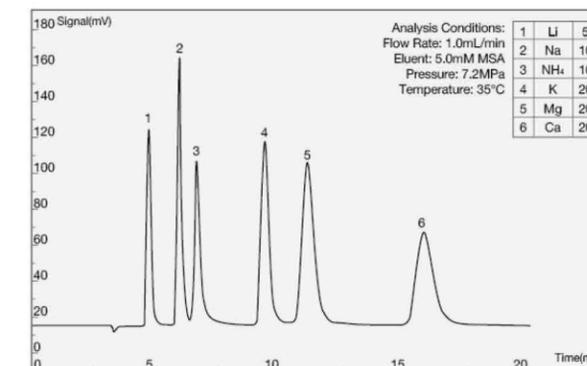
**SH-CC-3 COLUMN /4.6\*100MM /**

> A universal cation column, is mainly used to analyze 6 kinds of common cations ( $\text{Li}^+$ ,  $\text{Na}^+$ ,  $\text{NH}_4^+$ ,  $\text{K}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ). With well separability of  $\text{Na}^+$  and  $\text{NH}_4^+$  and low tailing factor of  $\text{Mg}^{2+}$  and  $\text{Ca}^{2+}$ , it is suitable for environmental, water quality, medical, food and other industries.



**SH-CC-4 COLUMN /4.0\*200MM /**

> A multifunctional cation column with MSA eluent. It can analyze 6 kinds of cations:  $\text{Li}^+$ ,  $\text{Na}^+$ ,  $\text{NH}_4^+$ ,  $\text{K}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ . With low tailing factor of  $\text{Mg}^{2+}$  and  $\text{Ca}^{2+}$  and 100% acetone tolerance, it is suitable for cationic analysis in environmental, water quality, medical, food and other industries.



**SH-G-1 COLUMN /4.6\*50MM /**

> A universal guard column. It can filter the insoluble solid particles in mobile phase and sample, prevent column from being polluted and prolong the life of column.



## CONDUCTIVITY DETECTOR

> The conductance detector continuously detects the conductivity of the eluate by loading voltage on the two electrodes in solution. The patented design of constant temperature conductivity detector can reduce the influence of temperature change, shield electromagnetic interference, increase signal response, and reduce baseline fluctuation and drift. The communication connection is carried out through COM port which is convenient for disassembly.

> Parameter

Measurement Range	Output Voltage	Baseline Noise	Baseline Drift	Maximum Pressure	Cell Volume
0-45000 $\mu$ S	$\pm$ 6000mV	$\leq$ 0.05%FS	$\leq$ 3%FS/30min	10MPa	$\leq$ 0.5 $\mu$ L



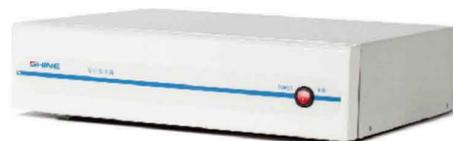
## AMPEROMETRIC DETECTOR

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.

- > There are three detection methods: DC ampere, pulsed ampere and integral ampere, which meet the needs of different samples;
- > Full plastic flow way to reduce the pollution of dissolved ions;
- > High sensitivity and extremely low detection limit.

> Parameter

Type	Working Electrode	Signal Range	Noise	Potential Range	Analog Output Voltage	Reference Electrode	Cell Volume	Detectable Substance
DC amperometric detection	Silver electrode	-13nA~+13nA	$\leq$ 10pA	-10000mV~+10000mV The increase is 1.0 mv	10, 100, 1000mV	Ag/AgCl (saturated KCl solution) lectrode	<0.5 $\mu$ L	CN <sup>-</sup> , I <sup>-</sup> , Br <sup>-</sup> , S <sup>2-</sup>
Pulsed amperometric detection	Gold electrode	50pC-200 $\mu$ C	< 10pC					sugar, aliphatic, amine, aldehyde, amino sugar



## UV DETECTOR

Ultraviolet detector realize the comparative analysis of the component content of the sample based on the fact that the substance has obvious absorbability to ultraviolet light. It is a modern analytical and experimental instrument in the fields of life science research, drug determination, chemical industry, food science and medical research.

- > The system has high reliability and stability, and the wavelength can be corrected when it turned on;
- > The instrument can control the wavelength, and carry out the stop flow automatic spectrum scanning;
- > The Z-shaped design and the constant temperature treatment in the flow cell reduces noise and drift;
- > The dual beam design of the instrument reduces the effect of environmental changes on drifting.

> Parameter

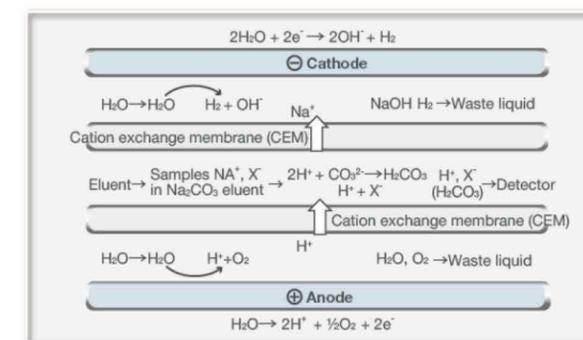
Baseline Noise	Baseline Drift	Minimum Detectable Concentration	Instrument Linearity	Maximum Allowable Deviation of Wavelength	Wavelength Repeatability
$\leq$ 0.5mAU	$\leq$ 5mAU/30min	Naphthalene $\leq$ 0.01 $\mu$ g/mL	$\geq$ 0.999	$\pm$ 2nm	<2nm



## SUPPRESSOR

### PRINCIPLE /

> Suppressor produces H<sup>+</sup> and OH<sup>-</sup> 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.



Principle diagram of anion suppressor

## SELF-REGENERATING ELECTROLYTIC MICRO-MEMBRANE SUPPRESSOR /

- > With advanced continuous regenerative membrane electric suppression technology, it doesn't need add acid or alkali to regenerate;
- > High suppression capacity, low background conductance, low noise, stable baseline and maintenance free;
- > Anti pollution, high pressure resistance and long life;
- > Compatible with 100% organic solvents;
- > It can match various types of ion chromatography products;
- > The signal line is connected by aeronautical connector, which is convenient for disassembly and assembly.

> Parameter

Model	Type	Current	Eluent	Pressure Resistance	PH Range	Dead Volume
SHY-A-6	Anion	0-300mA	CO <sub>3</sub> <sup>2-</sup> /HCO <sub>3</sub> <sup>-</sup> /OH <sup>-</sup>	6MPa	0-14	< 50 $\mu$ L
SHY-C-3	Cation	0-300mA	MSA	6MPa	0-14	< 50 $\mu$ L



## MINIATURE SELF-REGENERATING ELECTROLYTIC MICRO-MEMBRANE SUPPRESSOR /

- > It is suitable for microbore and low flow column, with small dead volume;
- > With advanced continuous regenerative membrane electric suppression technology, it doesn't need add acid or alkali to regenerate;
- > Anti pollution, high pressure resistance and long life;
- > Compatible with 100% organic solvents;
- > It can match various types of ion chromatography products;
- > The signal line is connected by aeronautical connector, which is convenient for disassembly and assembly.

> Parameter

Model	Type	Current	Eluent	Pressure Resistance	PH Range	Dead Volume
SHY-A-6S	Anion	0-300mA	CO <sub>3</sub> <sup>2-</sup> /HCO <sub>3</sub> <sup>-</sup> /OH <sup>-</sup>	4MPa	0-14	< 30 $\mu$ L



## AUTOSAMPLER

> With the continuous development of ion chromatography, its application field is expanding, and the number of samples to be tested is also increasing rapidly. Ion chromatograph with autosampler can realize sampling automation without manual duty, greatly improve work efficiency, and greatly avoid the interference of human errors on the results.

### DISC AUTOMATIC SAMPLER /

> SHA-1 is a basic disc autosampler, which is very simple to operate. The sample tray uses open design to be directly observed. Large-capacity sample tube makes the cleaning more sufficient and the analysis accuracy higher.

> Parameter

Model	Sample Tray Style	Sample Number	Maximum Injection volume	Sampling Method	Injection Reproducibility
SHA-1	Disc	13mL×20	500μL	Full quantitative loop	RSD<0.25%



### THREE DIMENSIONAL AUTOMATIC INJECTOR /

> SHA-15 is a three-dimensional autosampler with multiple sampling modes, built-in sample tray, which can effectively prevent pollution caused by external dust. The instrument has a partial sampling mode, one standard liquid can complete the standard curve test, reducing the workload of operators. The sample tray has various specifications to meet the needs of different samples.

> Parameter

Model	Sample Tray Style	Sample Number	Maximum Injection volume	Sampling Method	Injection Reproducibility
SHA-15	Three dimensional	2ml×108	500μL	Full quantitative loop	Full quantitative loop RSD≤0.25%
				Partial sampling	Partial sampling RSD≤0.5%
				Micro injection	Micro injection RSD≤0.8%



### DUAL CHANNEL AUTOMATIC INJECTOR /

> SHA-11D is an autosampler specially designed for two-channel instrument, that is, one sampler can match two channels or two analytical instruments at the same time, and the number of samples is large enough to meet the detection needs of large samples.

> Parameter

Model	Sample Tray Style	Sample Number	Maximum Injection Volume	Sampling Method	Injection Reproducibility
SHA-11D	Three dimensional	2ml×120	500μL	Full quantitative loop	RSD<0.25%



## SIX-WAY INJECTION VALVE

> The six-way valve is the most ideal sampler for IC and HPLC. It is composed of a circular sealing pad (rotor) and a fixed base (stator). It has the characteristics of simple structure, convenient to use, long service life and no maintenance in daily life.

### MANUAL SIX-WAY INJECTION VALVE /

> VI-11 manual six-way injection valve is a universal injection valve, which is widely used in IC and LC. Cutting valve continuous flow design is adopted to avoid the impact of instantaneous pressure on the system. With excellent performance and long life, it can ensure continuous injection of 30,000 times.

> Parameter

Model	Valve Switching Mode	Maximum Pressure	Outer Diameter of Tube	Rotor Sealing Material	Contact Material of Medium
VI-11	Manual	35MPa	φ1/16"	peek /ceramic /stainless steel	peek



### ELECTROMAGNETIC SIX-WAY SAMPLING VALVE /

> VF-02 electromagnetic six-way injection valve is an electrically driven automatic injection valve. It uses stepping motor to control position switching of valve. It has compact structure and superior performance. Both automatic and manual can be used independently and can be used as automatic sampling valves in chromatographic industry or as flow path switching valves. The space occupancy is small and the connection and control are made from the front side, which is convenient to install and use. The contact material of medium is peek, which can minimize the ion pollution. The ceramic seal improves the life of the sealing ring up to 100 thousand times.

> Parameter

Model	Valve Switching Mode	Maximum Pressure	Outer Diameter of Tube	Rotor Sealing Material	Contact Material of Medium	Drive Power Supply
VF-02	Stepping motor	35MPa	φ1/16"	peek/ ceramic /stainless steel	peek	24V DC



## ELUENT GENERATOR

> The eluent generator is the core technology of the new generation reagent-free ion chromatograph. It realizes the function of generating the required concentration of eluent on-line only by adding pure water, eliminating the time-consuming operation of manual preparation of eluent, which greatly improves the automation of analysis and avoids 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 that can not be completed by the equivalent pump, which further improves the accuracy of the analysis.



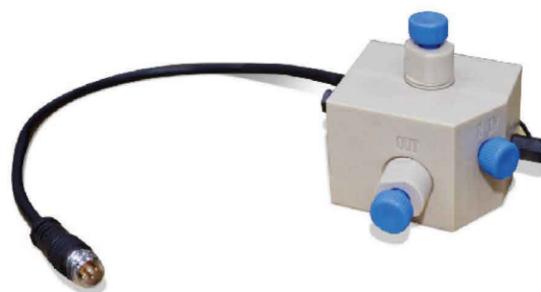
## ELUENT GENERATOR CARTRIDGE /

> The eluent generator cartridge is the replacement consumable of the eluent generator. The eluent is replaced with the electrode to prevent leakage. It is connected by aeronautical connector and peek connector, which is convenient for disassembly and assembly.



## CAPTURE COLUMN

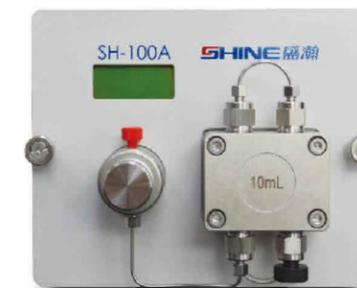
> The capture column can continuously remove the ionic contaminants in the eluent, thus achieving low drift during gradient operation.



## INFUSION PUMP

### HIGH PRESSURE INFUSION PUMP (STAINLESS STEEL) /

> High-pressure and low-pulse dual-piston tandem advection pump is made of stainless steel, which can achieve stable flow control without damper. The product adopts 32-bit embedded microprocessor with ARM7 core, electronic pressure fluctuation suppression technology, and high-precision DC servo motor, to realize the combinatorial analysis mode of isocratic, binary, quaternary gradient and micro-analysis, which is suitable for trace analysis in scientific research and special industries.



> Parameter

Model	Material	Flow Range	Pressure Range	Flow Velocity Reproducibility	Transfusion Structure	Pipeline Specification	System Protection	Power Supply
SH-100A	Stainless steel	0.001-9.999 mL/min	0-42MPa	<0.2%	Dual-piston tandem	1/16"	Maximum pressure setting protection	24V DC

### HIGH PRESSURE INFUSION PUMP (PEEK) /

> High-pressure and low-pulse dual-piston tandem advection pump is made of peek material, which can achieve stable flow control without damper. It can realize the combinatorial analysis mode of isocratic, binary, quaternary gradient and micro-analysis, and automatic piston rod cleaning and maintenance-free function, which is suitable for trace analysis in scientific research and special industries.



> Parameter

Model	Material	Flow Range	Pressure Range	Flow Velocity Reproducibility	Transfusion Structure	Pipeline Specification	System Protection	Power Supply
SH-120A	peek	0.001-9.999 mL/min	0-36MPa	<0.1%	Dual-piston tandem	1/16"	Maximum pressure protection	24V DC

## HIGH PRESSURE ELUENT UNIT

> Hydroxide ion chromatography system is an integrated system of ion chromatography separation and detection, which uses KOH or NaOH as eluent. The KOH or NaOH eluent becomes pure water after suppressed by suppressor. Compared with the carbonate eluent, the background conductance is lower, the signal response value is higher, So it applies to the detection of samples with lower concentration. The eluent generator can also use an isocratic pump to realize gradient elution function to complete the separation and detection of complex samples.

Because of the strong alkalinity of KOH or NaOH eluent, it is easy to deteriorate by absorbing CO<sub>2</sub> in the air, resulting in baseline drift and poor stability of the system. Therefore, it is necessary to protect KOH or NaOH eluent by isolating the outside air and reduce the detection error caused by the change of the eluent.



> Parameter

Water Storage	Working Pressure	Velocity	Working Inlet Pressure
5L	≤0.4Mpa	800mL/min	0~0.1Mpa

## ON-LINE DEGASSING DEVICE

> The bubbles are formed by dissolving or mixing air in the mobile phase solution, and noise peaks appear on the chromatogram when the bubbles enter the detector. When the bubbles enter the flow path or column, the flow velocity of the mobile phase becomes slower and unstable, resulting in fluctuation of the baseline. In the on-line degassing device, there is a transfusion tube made of porous synthetic resin film, which has a vacuum container outside. When the mobile phase passes through the transfusion tube, oxygen, nitrogen, carbon dioxide and so on will be removed from the inside of the membrane into the outside.



> Parameter

Model degassing	Degassing Efficiency (dissolved oxygen)	Vacuum Pressure	Maximum Flow	Internal Volume
SHT-3	Flow 1.0mL/min>70%;	-75kPa	10mL/min	300μL

## COLUMN SWITCHING DEVICE

> Column switching technology is an on-line technology commonly used in IC, which is mainly used for matrix elimination. By switching the columns with different stationary phases, the ions can be enriched by using the differential selectivity of stationary phases, and eliminating the interference of matrix. We can also switch columns with the same type of stationary phases.



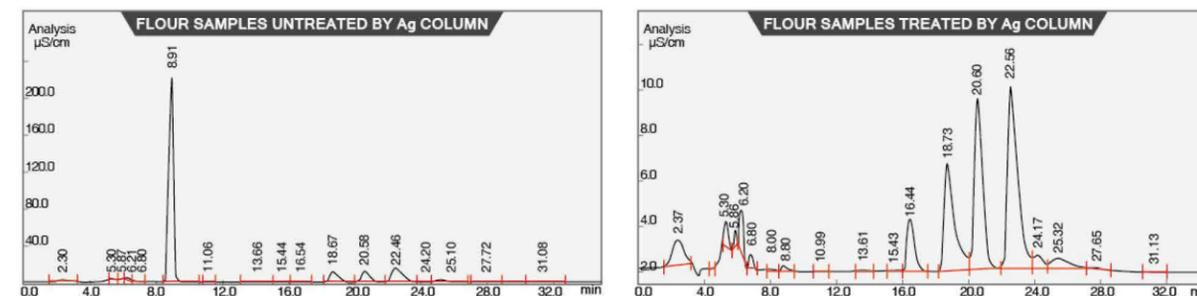
## SH SERIES PRETREATMENT COLUMN

### WHY SHOULD SAMPLES BE PRETREATED?

> In the process of analysis, the impurity interference, organic matter or metal ions in the sample will pollute the packings of column, reduce the separation ability and service life of the column, and the impurity ions will interfere with the separation of ions. So the sample pretreatment column should be used. It can effectively remove the organic matter and impurity ions in the sample, avoid the contamination of impurities on the column and the influence on the separation effect, effectively prolong the service life of the column and improve the separation effect of the sample.



### COMPARISON OF FLOUR SAMPLES BEFORE AND AFTER TREATED BY SH-Ag COLUMN:



### ORDERING INFORMATION/

Name	Specifications	Impurity Removal Mechanism	Application	Packaging Specification
SH IC-C18	1cc/2.5cc	Inverse adsorption mechanism	Remove hydrophobic compounds, which is not applicable to sample with too high or too low pH values	50pieces/packet
SH IC-RP	1cc/2.5cc	Inverse adsorption mechanism	Remove hydrophobic compounds, especially unsaturated compounds and aromatic compounds, which is applicable to sample with pH values ranging from 0 to 14.0	50pieces/packet
SH IC-P	1cc/2.5cc	Inverse adsorption mechanism	It has same function as RP and good selectivity for polar substances.	50pieces/packet
SH IC-H	1cc/2.5cc	Ion exchange	Remove alkali earth metal ions, transitional metal ions, and carbonate ions, and neutralize the strongly alkalinity of sample	50pieces/packet
SH IC-Na	1cc/2.5cc	Ion exchange	Remove alkali earth metal ions and transitional metal ions in sample	50pieces/packet
SH IC-Ag	1cc/2.5cc	Ion exchange	Remove Cl <sup>-</sup> , Br <sup>-</sup> , I <sup>-</sup> , AsO <sub>4</sub> <sup>3-</sup> , CrO <sub>4</sub> <sup>2-</sup> , CN <sup>-</sup> , MoO <sub>4</sub> <sup>2-</sup> , PO <sub>4</sub> <sup>3-</sup> , SeO <sub>3</sub> <sup>2-</sup> , SO <sub>3</sub> <sup>2-</sup> , SeCN <sub>3</sub> <sup>-</sup> , S <sub>2</sub> <sup>2-</sup> , SCN <sup>-</sup> , WO <sub>4</sub> <sup>2-</sup> etc.	50pieces/packet
SH IC-Ba	1cc/2.5cc	Ion exchange	Remove SO <sub>4</sub> <sup>2-</sup> . If the anion concentration of the sample is low, it needs to be activated with Cl <sup>-</sup> solution, and the pH value is stable at 1-14.	50pieces/packet
SH IC-HCO <sub>3</sub>	1cc/2.5cc	Ion exchange	Remove anionic pollutants and neutralize strong acidity of sample	50pieces/packet
SH IC-Ag/H	2.5cc	Ion exchange	Function equivalent to series use of Ag and H columns	50pieces/packet
SH IC-Ag/Na	2.5cc	Ion exchange	Function equivalent to series use of Ag and Na columns	50pieces/packet
SH IC-Ba/H	2.5cc	Ion exchange	Function equivalent to series use of Ba and H columns	50pieces/packet
SH IC-M	1cc/2.5cc	Chelating mechanism	Remove alkali earth metal ions, alkali and transitional metal ions	50pieces/packet

## NEEDLE FILTER

> Disposable needle filter is a fast, convenient and reliable filter commonly used in the laboratory. With beautiful appearance, light weight and high cleanliness, it mainly used for sample pre-filtration and particulate matter removal. It is the first choice for filtering small samples of IC, HPLC and GC. Each batch of needle filters were tested by ion chromatography. Testing the 1 mL pure water passed through the filter, the results showed that the ion dissolution level reached the level of ion chromatography analysis.



> Parameter

Sample	Filter Material	Aperture	Effective Filtration Area	Processing Capacity	Shell
Water	PES	0.22μm 0.45μm	1.0cm <sup>2</sup>	<10ml	Polypropylene
Organic	Nylon	0.22μm 0.45μm	1.0cm <sup>2</sup>	<10ml	Polypropylene

## OXYGEN BOMB COMBUSTION SAMPLE PROCESSING DEVICE

Oxygen bomb combustion sample processing device is a pretreatment device for the analysis of non-metallic elements in organic samples. The samples are burned in a airtight pure oxygen system. The components to be measured are released from the sample and absorbed by the absorbent liquid placed in the oxygen bottle. Then the absorbent liquid can be analyzed by IC. It is widely used in quantitative analysis of heavy metals and harmful halogen elements in electrical plastics products and circuit boards.



> Quantitative decomposition of halogen, S and volatile metals such as Hg, As and Cd;

> It can absorb flammable samples in liquid medium;

> Pressure vesse made of high grade special stainless steel.

> Parameter

Model	Withstand Pressure	Oxygen Bomb Airtight	Weight	Ignition Power Supply
YCY-4	20MPa	3.5MPa	2kg	0-3V AC safety voltage

## TUBE FURNACE

### ADSORBABLE ORGANIC HALOGEN (AOX) FURNACE/

> In the determination of adsorbable organic halogen AOX, organic chlorine, organic fluorine and organic bromide in water and sewage, acticarbon is used to adsorb organic halogen compounds in water. Then the activated carbon is put into the high temperature furnace to burn, decompose and converted into hydrogen halide (hydrogen of fluorine, chlorine and bromine). It is absorbed by alkaline aqueous solution and determined by ion chromatography.

> Parameter

Model	Temperature	Heating Area	Heating Rate	Fluctuation	Power
AOX-C	100-1150°C	200cm	≤50°C/min	±1°C	1.5KW



## SAND CORE FILTRATION DEVICE

Under the action of the vacuum pump, the sample is treated by flowing from the above glass through the sand core filter membrane into the conical bottle below. This is the ideal choice for vacuum filtration and degassing of IC solvent and mobile phase.

> The sand core filter is made of 100% borosilicate glass, which can resist the corrosive solvent;

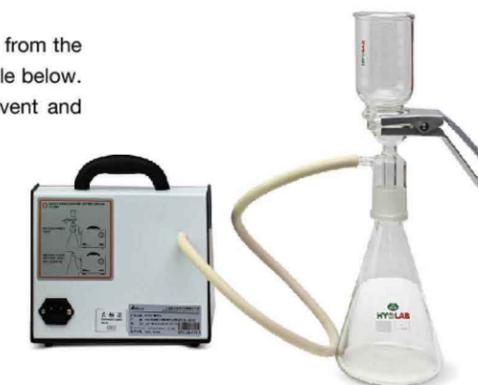
> It can filter out solid particles and bacteria in the sample;

> The no-oil degassing pump can reduce pollution of oil gas to samples;

> It is used in chemical analysis, hygienic inspection, environmental monitoring, biological products, pharmaceutical industry, scientific research and so on.

> Parameter

Material	Filter Cup Volume	Conical Bottle Capacity	Membrane	Vacuum Pressure
Borosilicate glass	250mL	1L	0.22μm/0.45μm	≥80kPa



## AUTOMATIC PRESSURE FILTER UNIT

> For the extraction of liquid from high viscosity and wet solid samples, ordinary filtration methods can not meet the requirements. The pressure filter device uses gas drive, which can effectively complete the pressure filter treatment of solid samples such as mud logging, solid waste and so on.



## SOLID PHASE MICRO-EXTRACTION

### SOLID PHASE MICRO-EXTRACTION TECHNOLOGY AND DEVICE/

> Solid phase micro-extraction (SPME) is a new extraction and separation technology developed on the basis of solid phase extraction, which commercialized in 1993.

The quartz optical fibers in syringe needles are used as carriers, and the stationary phase is coated on the surface. Quartz fibers in the needles were pushed out to enrich and extract the substances when the samples were tested. After completing the extraction, the fibers are pulled back into the needles and directly inserted into the gas chromatographic sampling inlet for heating and analysis, then separated and detected in the chromatographic column.



## SOLID PHASE MICRO-EXTRACTION DEVICE

### ADVANTAGE/

- > Simple structure, simple operation, fast, efficient and sensitive;
- > Avoid using organic solvents;
- > It integrates sampling, extraction, concentration and injection, which is easy to carry, and realizes on-site collection and enrichment of samples;
- > It can be used in conjunction with GC, LC, GCMS and LCMS. Both manual and automatic operation are feasible.

### ANALYSIS AREA/

> It is suitable for environmental, food, medicine, forensic and biochemical analysis, speciation analysis of metal and quasi-metal compounds, etc.



Filter membrane



Software key



Peek connector



Sample bottle



Eluent filter



Eluent bottle



Standard solution



Sample storage bottle



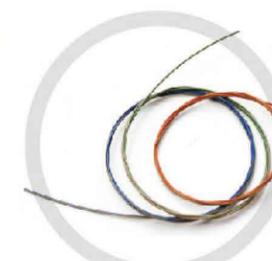
Reagent



Injection needle



Transfer liquid gun



Peek tube