

# Prominence HIC-SP Prominence HIC-NS

Shimadzu  
Ion Chromatograph





**Providing a higher level of sensitivity and expandability...**

**Prominence**

**HIC-SP**

**HIC-NS**

# Prominence HIC-SP/HIC-NS

Shimadzu  
Ion Chromatograph

## HIC-SP

When used in combination with an auto-suppressor, the Prominence HIC-SP enables ultrahigh-sensitivity,  $\mu\text{g/L}$ -level ion analysis. It is an advanced ion chromatograph that breaks through existing limits.

### Enabling Analysis with Even Higher Sensitivity

With the CDD-10AvP/10AsP conductivity detector, which monitors faint electrical signals, we have taken steps to reduce noise with the design layout of each part and using electronic components with low noise specifications. As a result, noise and drift inherent to any system have been significantly reduced.

### Superior Expandability and Space-Saving Design

Mounting an optional dual kit makes it possible to monitor the signals for two channels. This means that the operational capability of two detectors can be attained in the space required for one, enabling the simultaneous analysis of anions and cations on a single compact system.

## HIC-NS

The quality in every detail indicates the level of reliability and performance possible. Prominence HIC-NS is an ion analysis system configured with closely integrated high-performance modules.

### Adapting to Suppressor and Non-suppressor Systems

The CDD-10AsP is equipped with a suppressor control board. This makes it possible to control suppressors via the SCL-10AvP system controller. The suppressor function can be stopped as required, enabling selective operation as either a suppressor system for analyzing anions or a non-suppressor system for analyzing cations.

### Supporting Validation

A VP key has been provided on the CDD-10AvP/10AsP unit. This makes the calibration of cell constants and conductivity validation easier, and will prove to be an indispensable tool for instrument management.

# Prominence HIC-SP



**Shimadzu's suppressor-type ion chromatograph achieves even greater sensitivity.**

## Ultrahigh, $\mu\text{g/L}$ -Level Sensitivity

Combining with the latest type of auto-suppressor enhances the performance of the ion chromatograph even further, enabling ultrahigh-sensitivity ion analysis with, for example, a detection limit (S/N=3) of 0.25  $\mu\text{g/L}$  for chlorine anions.

## Easy-Maintenance Specifications – No Regeneration Step Required

A column-type suppressor cartridge is used. Electrochemical regeneration is performed automatically with every analysis so that a chemical regenerant is not required. This simplicity ensures superior performance and minimal maintenance.

## Superior Operability

Each module is controlled centrally at the system controller, making it possible to obtain highly reliable analysis results. Using an LCsolution PC workstation can make operation even easier.

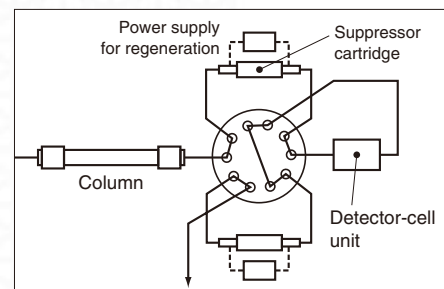
# HIC-20A Super



**The secret of high precision lies in the suppressor package.**

The HIC-20A Super suppressor package consists of the CDD-10ASP conductivity detector, a suppressor cartridge, and a column oven. The suppressor cartridge and detector cell are housed in the column oven and are regulated at a constant temperature with dual temperature controls.

The suppressor function can be enabled and disabled by the software. This means that suppressor operation and non-suppressor operation can be performed with the same system.



## System

The table on the right details the configuration of the basic system.

The dual flow-line analysis system is an example of a system that uses suppressor operation to analyze anions and non-suppressor operation to analyze cations.

Use peripheral devices and parts as required. Refer to the section on the Prominence HIC-NS for details on the analysis of cations.

## Suppressors

There are suppressors for anion analysis and suppressors for cation analysis.

Select a model that is suitable for the type of ions to be analyzed.

## Columns

There are columns for anion analysis and columns for cation analysis. Select a model that is suitable for the type of ions to be analyzed.

Shim-pack IC-SA2 is a general-purpose column for anion analysis.

Shim-pack IC-SA3 is a high-separation column that can

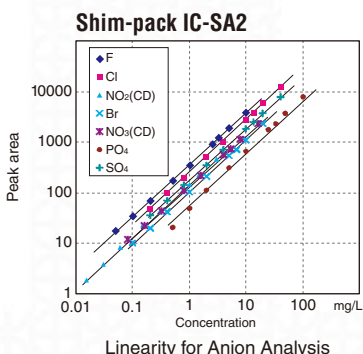
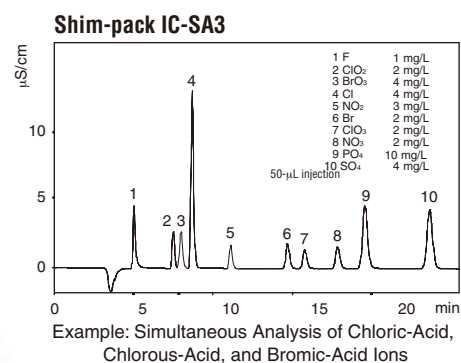
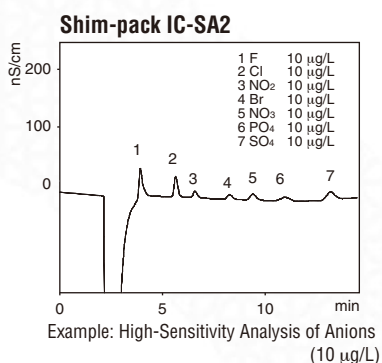
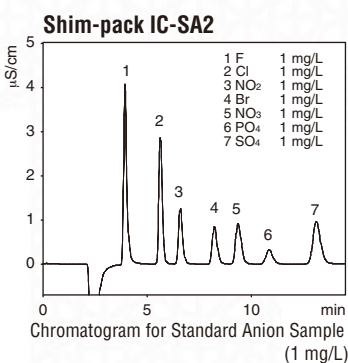
simultaneously analyze chloric-acid, chlorous-acid, and bromic-acid ions.

\*The columns with "(G)" after the name are guard columns.

Part Number	Description	Model	Quantity		
			Single	Dual	Concentration
228-45012-XX	System controller	CBM-20A	1	1	1
228-45060-91	Option box VP	—	0	1	1
228-45091-XX	Solvent delivery unit	LC-20ADSP	1	2	2
228-45018-32	Online degasser	DGU-20A3	1	1	1
228-45041-31	Reservoir tray	—	1	1	1
228-45006-XX	Auto-sampler	SIL-20A	1	0	0
228-45057-XX	Auto-sampler	SIL-10AP	0	1	0
228-45013-91	High-pressure flow-line selection valve	FCV-12AH	0	1	1
228-45090-XX	Suppressor package	HIC-20A Super	1	1	1
228-41305-91	Connection-parts kit for dual flow line	—	0	1	0
228-41620-91	Connection-parts kit for concentration	—	0	0	1
228-33285-91	Connection-parts kit for inert LC	—	1	1	1
228-41302-91	Dual kit NS	—	0	1	0
—	LC workstation	LCsolution Single Ver.1.24 or later	1	1	1

Part Number	Description
228-40612-91	Suppressor cartridge for anion analysis
228-40613-91	Suppressor cartridge for cation analysis

Part Number	Description	Model
228-38983-91	Shim-pack IC-SA2	250mm x 4.0mm i.d.
228-41600-91	Shim-pack IC-SA3	250mm x 4.0mm i.d.
228-36605-91	Shim-pack IC-SC1	100mm x 4.6mm i.d.
228-38983-92	Shim-pack IC-SA2(G)	10mm x 4.6mm i.d.
228-41600-92	Shim-pack IC-SA3(G)	10mm x 4.6mm i.d.
228-36605-92	Shim-pack IC-SC1(G)	10mm x 4.6mm i.d.



Component	Concentration (µg/L)	RSD (%)
F	50	0.46
Cl	200	0.23
NO <sub>2</sub>	15	5.41
Br	100	0.71
NO <sub>3</sub>	80	0.54
PO <sub>4</sub>	500	0.63
SO <sub>4</sub>	200	2.3

Reproducibility for Anion Analysis

(Reproducibility result at the lower concentration limit for the quantification range specified in Japanese Water Supply Test Methods, 2001 Edition)

# Prominence HIC-NS



**Shimadzu's non-suppressor-type ion chromatograph offers both simplicity and performance.**

## **Non-suppressor Operation Ensures Greater Flexibility**

There are no limitations on mobile-phase conditions, such as types of competing ions and pH values. Selection and adjustment can be performed in accordance with the sample and target components. The degree of freedom offered by non-suppressor method enables various types of ion analysis. Another advantage is that there is no external column peak broadening.

## **Modules Capable of High Performance**

This system optimizes the Prominence-series modules of which Shimadzu is justly proud. It is this that makes high sensitivity attainable with non-suppressor operation.

## **Superior Operability**

In addition to the usual single-flow-line analysis system, the modules can be configured to create a dual-flow-line system that can simultaneously measure anions and cations. Expansion to a dual detection system incorporating post-column derivatization is also possible.

# CDD-10A<sub>VP</sub>



**The conductivity detector is at the heart of the system.**

With the addition of an optional board, The CDD-10A<sub>VP</sub> conductivity detector can perform simultaneous 2-channel detection of anions and cations. In other words, the capability of two units is possible in the space required for just one.

Adding a suppressor option to the unit enables expansion to a suppressor system.\*

\*Modification of the CTO-20AC is required.

## System

The table on the right details the configuration of the basic system.

The dual flow-line analysis system is an example of a system that uses non-suppressor operation to analyze both anions and cations.

A printer is required separately. Use peripheral devices and parts as required. Refer to the section on the Prominence HIC-SP for details on the concentration analysis of anions.

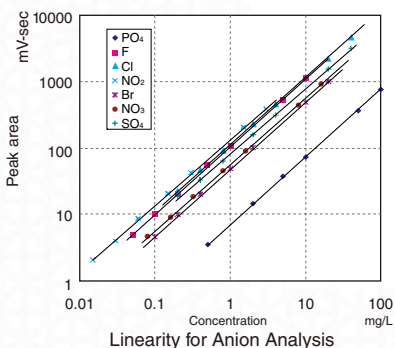
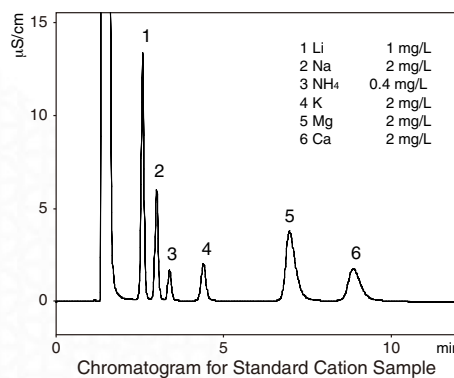
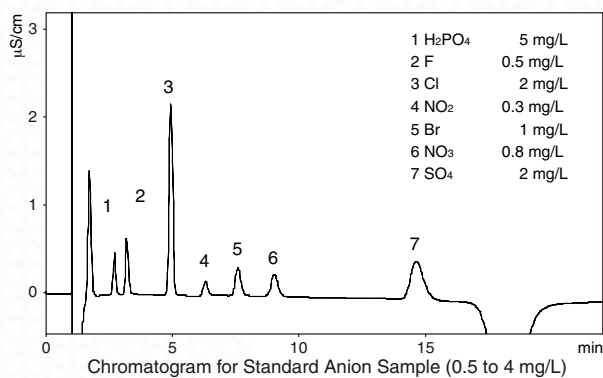
## Columns

The are columns for anion analysis and columns for cation analysis. Select a model that is suitable for the type of ions to be analyzed.

\*The columns with "(G)" after the name are guard columns.

Part Number	Description	Model	Quantity		
			Single	Dual	Concentration
228-45012-XX	System controller	CBM-20A	1	1	1
228-45060-91	Option box VP	—	0	1	1
228-45091-XX	Solvent delivery unit	LC-20ADSP	1	2	2
228-45018-32	Online degasser	DGU-20A3	1	1	1
228-45041-31	Reservoir tray	—	1	1	1
228-45006-XX	Auto-sampler	SIL-20A	1	0	0
228-45057-XX	Auto-sampler	SIL-10AP	0	1	0
228-45013-91	High-pressure flow-line selection valve	FCV-12AH	0	1	1
228-45010-XX	Column oven	CTO-20AC	1	1	1
228-45054-XX	Conductivity detector	CDD-10AVP	1	1	1
228-41305-91	Connection-parts kit for dual flow line	—	0	1	0
228-41620-91	Connection-parts kit for concentration	—	0	0	1
228-33285-91	Connection-parts kit for inert LC	—	1	1	1
228-41302-91	Dual kit NS	—	0	1	0
—	LC workstation	LCsolution Single Ver.1.24 or later	1	1	1

Part Number	Description	Model
228-31076-91	Shim-pack IC-A3	150mm x 4.6mm i.d.
228-41616-91	Shim-pack IC-C4	150mm x 4.6mm i.d.
228-36605-91	Shim-pack IC-SC1	150mm x 4.6mm i.d.
228-31076-92	Shim-pack IC-A3(G)	10mm x 4.6mm i.d.
228-59900-92	Shim-pack IC-GC4	8mm x 3mm i.d.
228-36605-92	Shim-pack IC-SC1(G)	10mm x 4.6mm i.d.



Component	Concentration (µg/L)	RSD (%)
F	50	1.81
Cl	200	0.31
NO <sub>2</sub>	15	5.75
Br	100	3.28
NO <sub>3</sub>	80	3.58
PO <sub>4</sub>	500	1.92
SO <sub>4</sub>	200	1.68

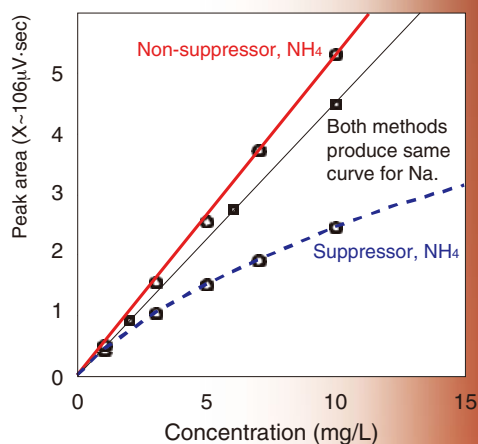
Reproducibility for Anion Analysis

(Reproducibility result at the lower concentration limit for the quantification range specified in Japanese Water Supply Test Methods, 2001 Edition)

## Flexible Adaptation to Ion Characteristics

If suppressor-type ion chromatography is used to analyze amines containing ammonium, the concentration and response are not proportional. Therefore the calibration curve is not linear. However, if the non-suppressor method is used a linear calibration curve is seen.

The suppressor function can be enabled and disabled by the software. This means that suppressor operation and non-suppressor operation can be performed with the same system.



## Specifications

Item	Prominence HIC-SP	Prominence HIC-NS
Detection method	Conductivity	Conductivity
Detection system	Suppressor	Non-suppressor
Type	Modular	Modular
Solvent delivery method	Parallel-type dual plunger	Parallel-type dual plunger
Flow-rate setting range	0.0001 to 10.0000 mL/min (0.0001-mL steps)	0.0001 to 10.0000 mL/min (0.0001-mL steps)
Flow-rate accuracy	±1% or ±0.5 μL	±1% or ±0.5 μL
Flow-rate precision	±0.3%	±0.3%
Sample-injection method	Variable sample-injection volume	Variable sample-injection volume
Sample-injection volume	0.1 to 100 μL	0.1 to 100 μL
Oven control method	Forced air-circulation	Forced air-circulation
Temperature setting range	4°C to 85°C	4°C to 85°C
Control temperature	10°C below room temperature to 80°C	10°C below room temperature to 80°C
Cell capacity	0.25 μL	0.25 μL
Range	0.01 to 51,200 μS/cm	0.01 to 51,200 μS/cm
Data processing	External data processing	External data processing
External control	PC connection supported	PC connection supported
Dimensions	520 (W) x 500 (D) x 630 (H) mm	520 (W) x 500 (D) x 630 (H) mm
Weight	74 kg	72 kg
Power requirements	100 VAC, 955 VA max.	100 VAC, 955 VA max.
Operating ambient temperature	4°C to 35°C	4°C to 35°C



JQA-0376

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Printed in Japan 3295-06908-10A-NS

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