


Anion Suppressor Ion Chromatograph

HIC-ESP





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The HIC-ESP is a new anion suppressor ion chromatograph with built-in electrodyalytic suppressor, boasting the same low carryover and excellent injection precision characteristic of Shimadzu HPLCs to bring you highly-reliable results. The newly developed anion suppressor prevents peak spreading and achieves high sensitivity, providing stable functionality even over long periods of use.

The HIC-ESP is suitable for applications in a wide range of fields including environmental science, medicine, chemistry and food science.

- A newly-developed anion suppressor unit achieves high sensitivity and high reliability in analysis
- Complete support and ease-of-use throughout your workflow, from analysis through data processing to report creation
- Compact design for a more efficient use of lab space

Conductivity Detector

CDD-10A_{VP}

A temperature-regulating device in the detection cell and the placement of the detection cell in the column oven ensure precise temperature control. This enables analysis with low noise conditions and a stable baseline even using electrical conductivity detection which is sensitive to temperature fluctuations.

Degassing Unit

DGU-403

Because the unit adopts an online degassing system with high performance and low internal volume, it is easy to replace the eluent and more stable analysis is achieved. Offline degassing of the eluent with ultrasonic waves or decompression is not necessary.

Anion Suppressor Unit

ICDS™-40A

This is an electroalytic suppressor unit which is built into the top part of the column oven. It achieves high performance even with low internal volume.



Solvent Delivery Pump

LC-20A_i

An inert-type pump that optimizes solvent delivery control. Detection of low-level noise is possible even using electrical conductivity detection which is sensitive to pressure changes.

Column Oven

CTO-40S

The forced air circulation oven has extremely precise temperature regulation, and can be used with a variety of column lengths up to 300 mm.

Autosampler

SIL-20A/20AC (Inert kit)

The SIL-20A/20AC is a full-volume autosampler with very low carryover, which allows high-accuracy, high-speed injections of volumes from 0.1µL up. The wetted parts are made inert using the inert kit.

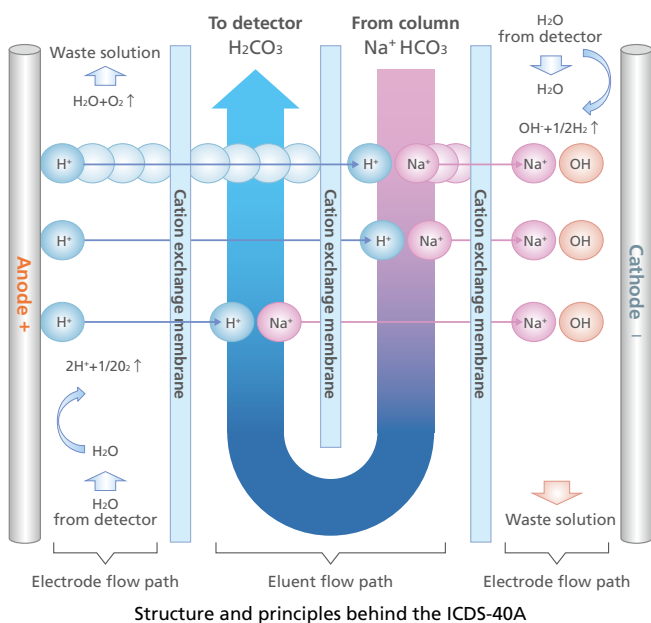
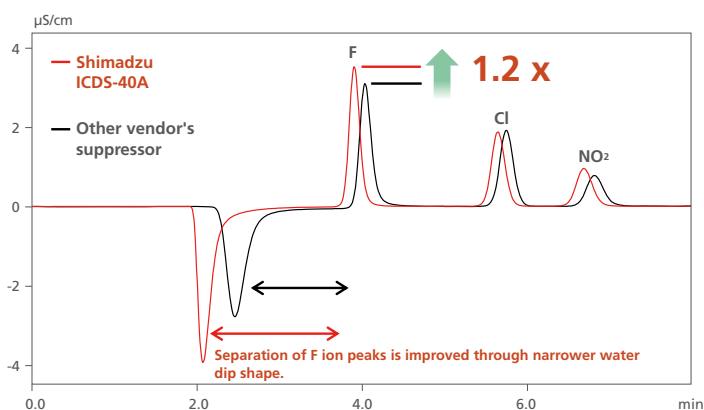


High sensitivity and reliability

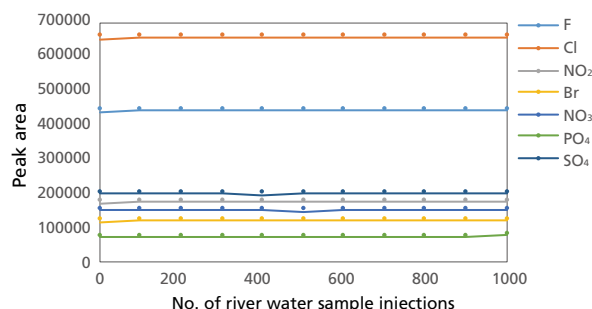
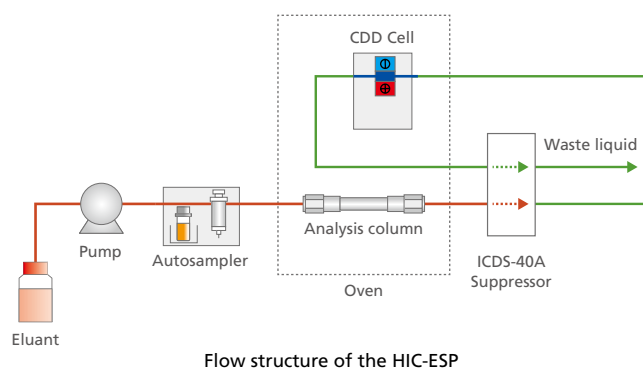
With a unique design where the eluent flow path bends back around, combined with optimized dialytic, the new ICDS-40A anion suppressor unit achieves higher efficiency and stable suppressing while maintaining a small internal volume (patent pending). Combining this suppressor with high-quality HPLC units enables highly-reliable analytical results.

■ The ICDS-40A achieves high sensitivity, reliability and robustness

The ICDS-40A reduces peak spreading, increasing the sensitivity for components with low retention such as fluorine ions, and improves water dip separation, enabling highly-reliable results. Using an electrodynamic system which can carry out analysis and regenerations simultaneously, the analysis cycle time can be reduced and consecutive regeneration achieved, increasing the flexibility of the analysis time settings. In addition, the suppressor uses waste solution from the detector as regenerating solution, making environmentally-unfriendly regenerating solutions such as sulfuric acid unnecessary.

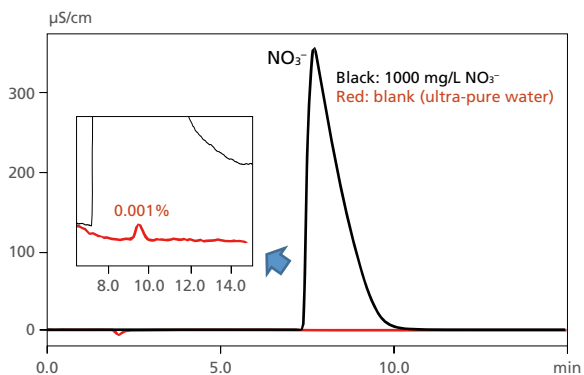


The plot on the right shows peak response from analysis of a standard solution after each 100 injections of river water. Even after a long, continuous analysis of the sample, the peak intensity for each ion is stable. The excellent ion exchange function of the ICDS-40A is supported by the robustness of the HIC-ESP over a long analysis.



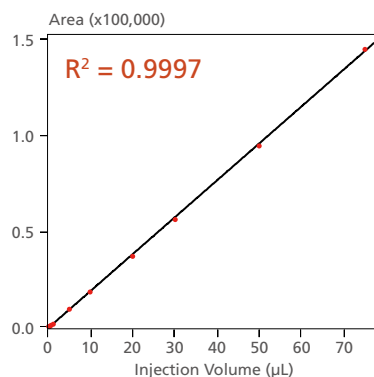
High-quality HPLC units make up the HIC-ESP

This unique ion chromatograph combines various features indispensable to obtain highly-reliable analytical results: excellent solvent delivery performance, low carryover, injection speed (as low as 10 secs), sample injection precision and repeatability, precise oven temperature regulation and more.



Low carryover

* Blank sample injected after analysis of 1000 mg/L NO₃⁻ standard solution.



Injection repeatability and volume precision

Injection volume (μL)	Area RSD(%) (n=5)
0.2	1.05
1	0.86
10	0.25
20	0.04
50	0.04
75	0.08

* Analysis changing the injection volume of the standard solution 10 mg/L Br

Compact design opens up lab space

The HIC-ESP system is just 420 mm wide, taking up significantly less space on the bench.



HIC-ESP

Width = 420 mm

Instrument from vendor B

Width = 780 mm +

Instrument from vendor A

Width = 800 mm +

Complete support and ease-of-use throughout your workflow

Manage analysis, data processing and reports all from LabSolutions™

Settings for HIC-ESP analysis parameters, continuous analysis, auto-shutdown, data processing, and report creation can all be managed from LabSolutions analysis software. Data integrity can be handled with the addition of LabSolutions DB and LabSolutions CS.



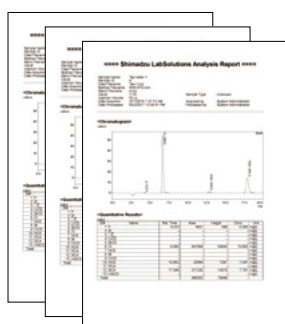
Simple, all-in-one checks of calibration curves and peak integration with the results browser function

Ret. time	Area	Height	Conc. (mg/L)	Accuracy (%)	Deviation	QC Check Results
2.028	18.021	19.112	1.000	100.0	0.000	
2.028	142.442	24.172	1.000	100.0	0.000	
2.028	284.885	48.344	1.000	100.0	0.000	
2.028	427.327	72.516	1.000	100.0	0.000	
2.028	569.770	96.688	1.000	100.0	0.000	
2.028	712.212	120.860	1.000	100.0	0.000	
2.028	854.655	145.032	1.000	100.0	0.000	
2.028	997.097	169.204	1.000	100.0	0.000	
2.028	1139.540	193.376	1.000	100.0	0.000	
2.028	1281.982	217.548	1.000	100.0	0.000	
2.028	1424.425	241.720	1.000	100.0	0.000	
2.028	1566.867	265.892	1.000	100.0	0.000	
2.028	1709.310	290.064	1.000	100.0	0.000	
2.028	1851.752	314.236	1.000	100.0	0.000	
2.028	1994.195	338.408	1.000	100.0	0.000	
2.028	2136.637	362.580	1.000	100.0	0.000	
2.028	2279.080	386.752	1.000	100.0	0.000	
2.028	2421.522	410.924	1.000	100.0	0.000	
2.028	2563.965	435.096	1.000	100.0	0.000	
2.028	2706.407	459.268	1.000	100.0	0.000	
2.028	2848.850	483.440	1.000	100.0	0.000	
2.028	2991.292	507.612	1.000	100.0	0.000	
2.028	3133.735	531.784	1.000	100.0	0.000	
2.028	3276.177	555.956	1.000	100.0	0.000	
2.028	3418.620	580.128	1.000	100.0	0.000	
2.028	3561.062	604.300	1.000	100.0	0.000	
2.028	3703.505	628.472	1.000	100.0	0.000	
2.028	3845.947	652.644	1.000	100.0	0.000	

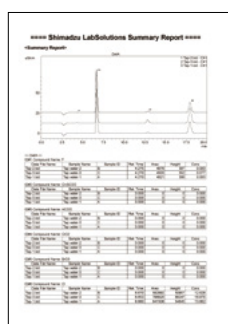
Automatic judgments on analytical results

Results can be checked and errors or outliers detected much more quickly, with the software automatically judging calibration curve validity, maximum and minimum limits for sample values, etc.

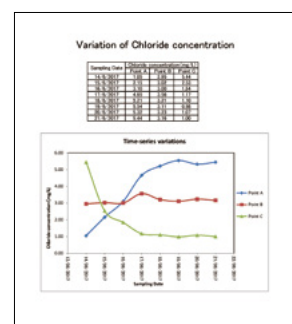
Easily produce reports and summaries



Reports with detailed information about individual sample data



Summary report compiling data from multiple reports



Multi-data report with graphs of data from multiple analyses

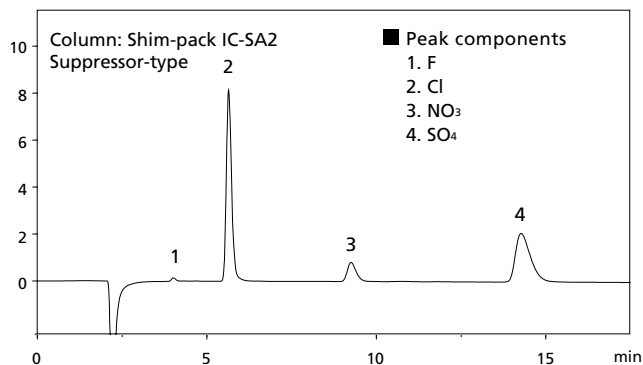
The report function allows the automatic creation of individual analysis or summary reports, as well as multi-data reports* which can produce graphs and handle other data processing for results from multiple samples. The data can be automatically imported into a premade template, reducing the time needed to write reports and reducing the possibility of errors.

*Multi-data reports are an optional LabSolutions DB/CS function

Application

■ For environmental water analysis

The example below shows an analysis of river water according to the standard method EPA300.0 (Part A) prescribed by the US Environmental Protection Agency (EPA) for environmental water anion analysis.



Related Products

■ Suppressor accessories

Product name	Part no.	Description
Suppressor and power supply set	S228-74020-41	Includes the following parts: - Anion suppressor ICDS-40A - Suppressor power supply - Piping kit for connecting the suppressor
CTO-40S Suppressor Remodeling Kit	S228-68371-41	Parts for mounting the suppressor to CTO-40S
Anion suppressor ICDS-40A (consumable)	S228-74006-41	Suppressor for anion analysis



■ Column lineup for suppressor-type anion analysis

Type	Part no.	Column name	Size	Housing material	Resin / Functional group	Particle size	Features
Analytical column	228-38983-91	Shim-pack™ IC-SA2	4.0 mm I.D. × 250 mm L.	PEEK	Polyvinylalcohol / Quaternary ammonium	9 μm	General use column for suppressor-type anion analysis
	228-41600-91	Shim-pack IC-SA3	4.0 mm I.D. × 250 mm L.			5 μm	High performance anion separation column for chloric acid analysis
Guard column	228-38983-92	Shim-pack IC-SA2(G)	4.6 mm I.D. × 10 mm L.			9 μm	Guard column for Shim-pack IC-SA2
	228-41600-92	Shim-pack IC-SA3(G)	4.6 mm I.D. × 10 mm L.			5 μm	Guard column for Shim-pack IC-SA3

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