

□ Product specification of LVI-S-250

Injection method	・Split ・Splitless ・Cold split ・Cold splitless ・On-column ・Mass injection ・Derivatization injection
Sample injection amount	1 ~ 200μl
Heating method	Hot air method
Temperature control range	40 °C ~ 300 °C (Room temperature 25 °C, column oven 50 °C)
Maximum heating rate	150 °C/min
Cooling rate	300 °C→ 50 °C/3min
Control	Controller box (Software enables operation from a personal computer)
Display panel	240 * 96 dots, LCD touch panel display
Mountable on GC	Compatible with Agilent, SHIMAZU, Thermo, BRUKER GC
Power consumption	100 V (120 VA)
Size	W130 mm D295 mm H180 mm (Controller box) W130 mm D160 mm H110 mm (Pumping unit)
Weight	3.3 kg (Controller box) 1.5 kg (Pumping unit)

Software (standard) specifications

- PC spec for software
- ・ Windows 7、Windows 8、Windows 10
 - ・ IBM PC/A compatible machine with Intel Pentium 230MHz or faster processorSyringe
 - ・ Hard disk with 200MB or more free space
 - ・ Display that supports screen resolution of 1024*768 or higher and color display of 256 colors or higher
 - ・ RS232C port or USB1.1/2.0 port
 - ・ CD-ROM drive

Product specification, appearance, configuration, etc. are subject to change for improvement without notice. Company names and product names listed in the catalog are registered trademarks or trademarks of each company.

Please contact us or your distributor for inquiries about products.

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AiSTI SCIENCE Co., Ltd.

【HEAD QUARTER】
#18-3, ARIMOTO, WAKAYAMA-CITY, WAKAYAMA, JAPAN
TEL.+81-(0)80-3111-1654

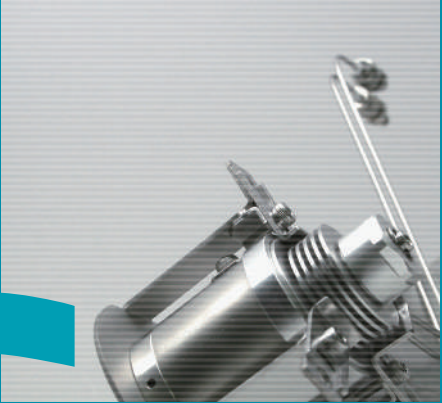
Mail to : as@aisti.co.jp
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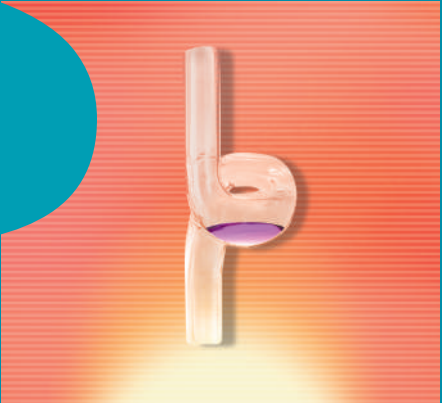
LVI-S250
For Gas Chromatography

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Beyond your Imagination

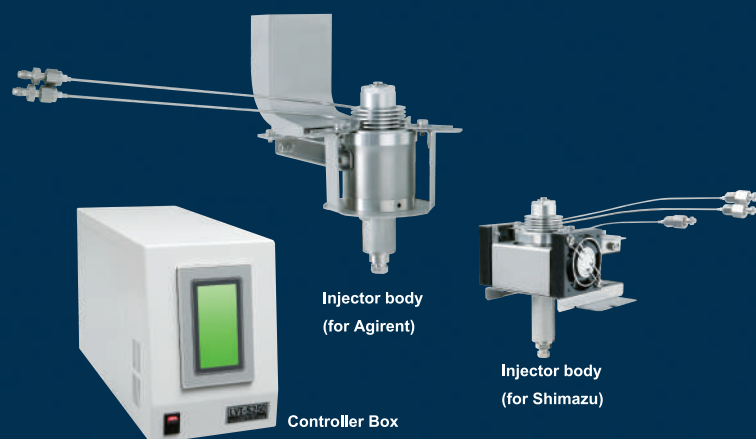


Large Volume Injection for GC

LVI-S250
For Gas Chromatography

Toward Groundbreaking Change

LVI-S250 For Gas Chromatography



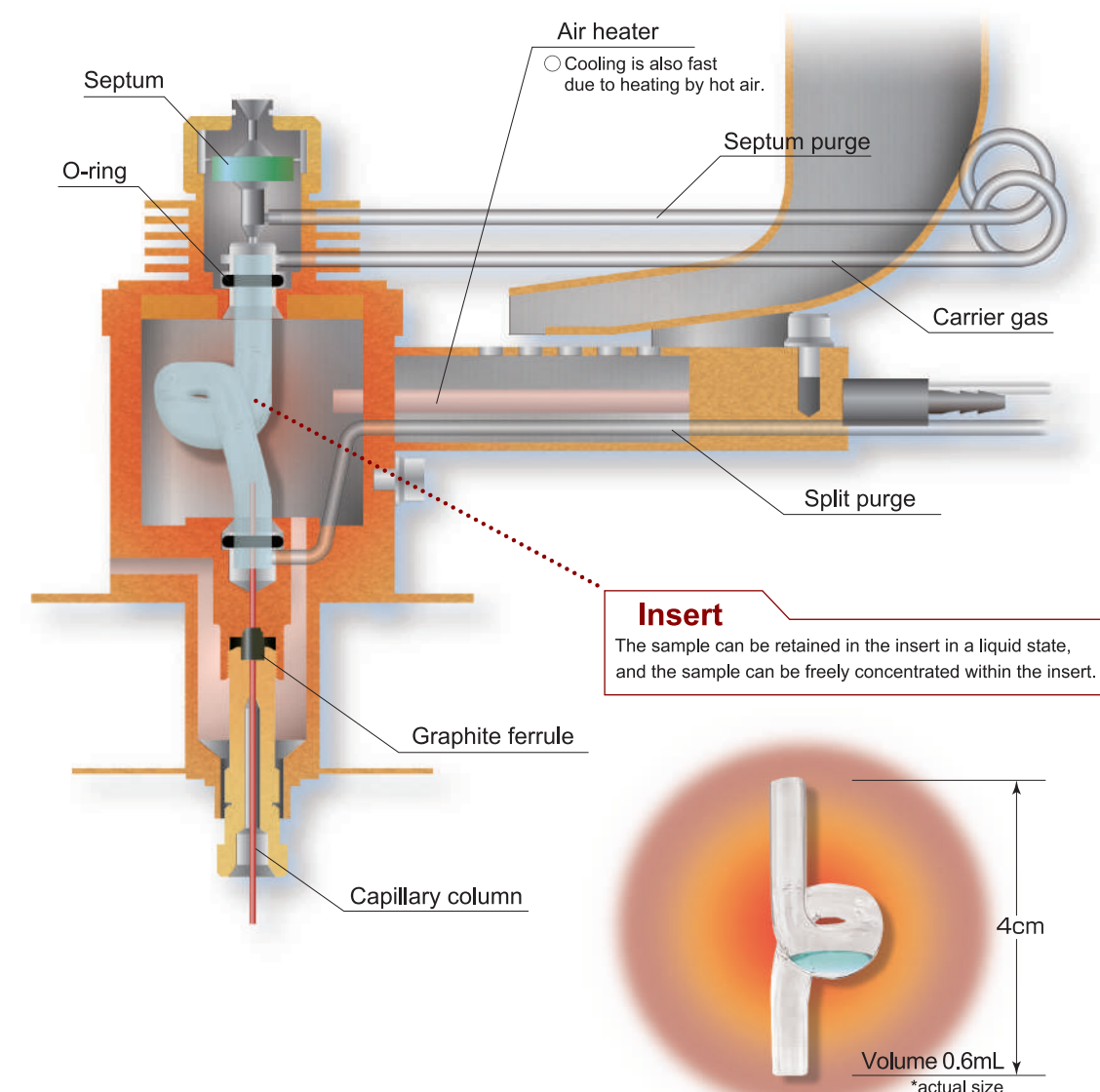
the Large volume injection port device for GC LVI-S250 (Ravistoma)

*Mountable on GC: Compatible with Agilent, SHIMADZU, Thermo, BRUKER GC

LVI-S250 For Gas Chromatography PECULIARITY

Rapid and high sensitivity made possible
by the new insert developed in-house.

- Unique insert shape enables easy mass injection
- High-sensitivity analysis of low-concentration samples with greatly improved sensitivity
- Faster pretreatment by minimizing sample volume and omitting concentration operations



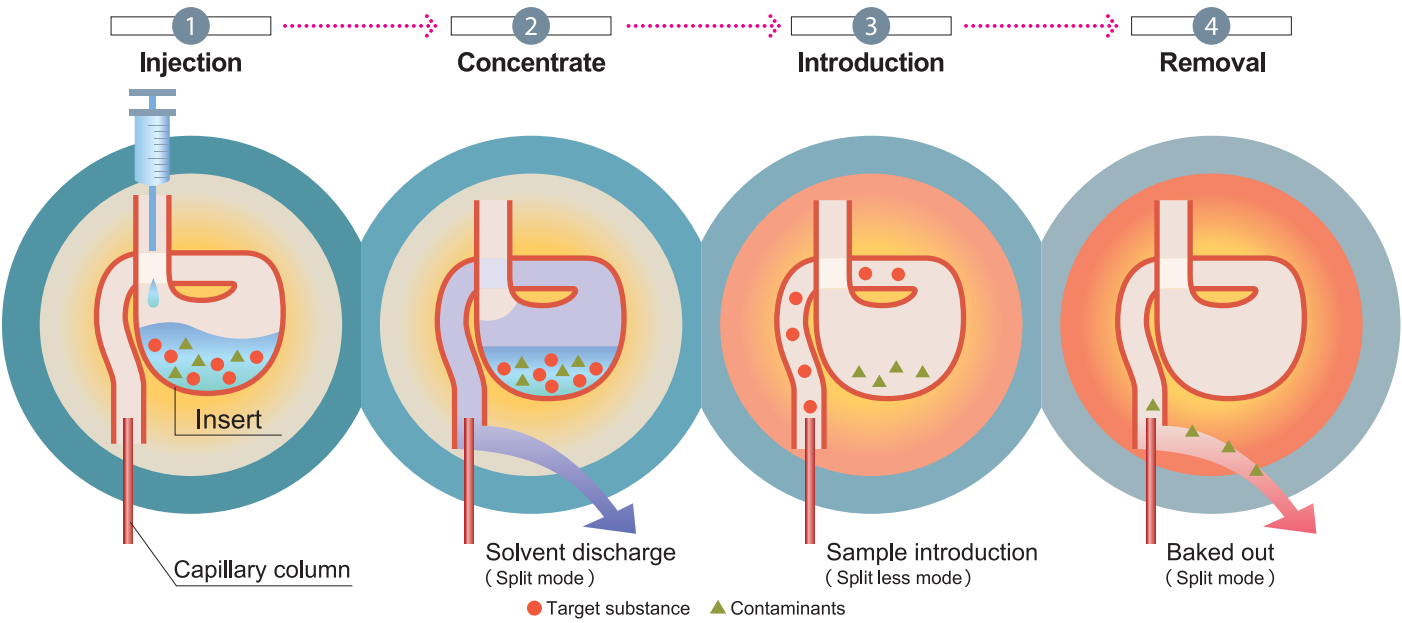
Solved the problems of the conventional large-volume injection method
LVI-S250 stomach shaped, new type insert

Since the sample can be held in a liquid state within the stomach-shaped insert, it is easier to set the conditions for the large-volume injection method. Moreover, since the sample in the insert can be introduced into the column at a low temperature, it can also be used for heat-sensitive substances. In addition, inserts can be easily replaced, improving maintainability.

LVI Methodology

the Large volume injection method

Stomach shaped insert facilitates its bolus injection.



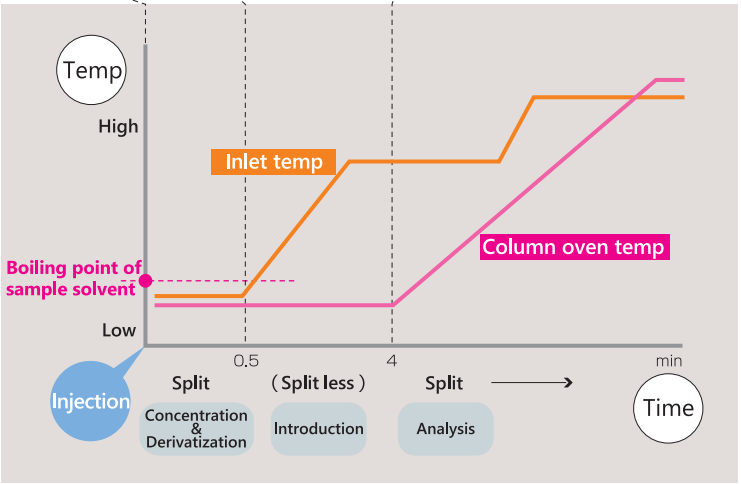
In order to prevent the sample solvent from bumping inside the insert, the sample is injected with the inlet temperature set lower

In split mode, evaporating solvent vapors are exhausted and the sample is concentrated in the insert.

In the split less mode, the injection port temperature is raised, and the target substance is introduced into the separation column for analysis.

Switch to split mode and remove any remaining contaminants from the insert.

Set the inlet temperature to below the boiling point of the solvent during the injection and concentration. After concentrating, the injection port temperature is raised to introduce the target substance into the column. The column oven temperature remains low until the target substance has been introduced into the column. This will re-concentrate at the top of the column. Then set the normal analysis conditions. In the case of injecting 50 μ l of hexane solvent, it takes 30 seconds from injection to concentration, and about 3 minutes to introduce.

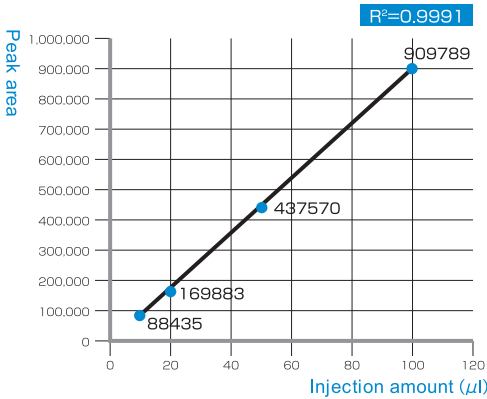


□ Inlet and GC conditions concepts

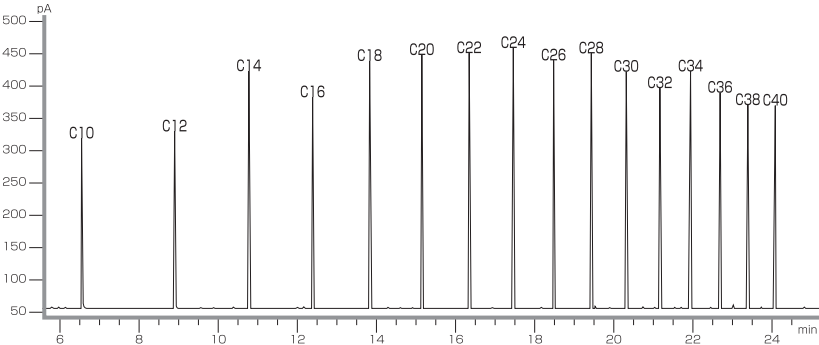
Measurement accuracy

□ Injection volume

Using the linear hydrocarbon C16 in Hexane, we investigated the relationship between the injection volume (10, 20, 50, 100 μ l) and each peak area, and found that sensitivity increases in proportion to the injection volume. confirmed.



□ Chromatogram



This shows the chromatogram (FID) when 50 μ l of n-C10 to n-C40 in Hezane was injected. You can obtain a chromatogram that shows clear peak shapes from low to high boiling points.

□ Reproducibility

No.	1	2	3	4	5	6	7	8	RSD%
n-C10	185.9	186.2	183.2	187.3	187.8	184.4	186.5	185.5	0.81
n-C12	191.0	192.1	189.8	193.3	193.4	189.7	190.6	191.3	0.75
n-C14	216.3	217.4	215.0	218.6	219.1	214.8	215.2	216.1	0.76
n-C16	203.8	204.6	203.6	206.4	207.4	202.6	203.0	203.7	0.82
n-C18	228.6	229.6	228.0	230.5	231.7	226.9	227.1	229.0	0.72
n-C20	242.5	243.7	242.2	244.3	245.6	240.0	240.7	242.4	0.76
n-C22	249.5	251.0	249.3	251.1	253.0	247.1	247.5	249.2	0.78
n-C24	241.3	242.7	240.9	243.0	244.8	238.9	240.8	241.0	0.74
n-C26	231.7	233.1	231.1	233.1	234.9	229.1	229.7	231.3	0.82
n-C28	235.6	236.9	235.1	237.2	239.1	234.2	233.7	235.5	0.74
n-C30	222.4	223.6	222.0	223.9	225.7	221.4	220.6	222.5	0.72
n-C32	222.2	223.2	221.6	223.4	225.4	220.1	220.6	222.4	0.76
n-C34	233.4	234.2	232.5	234.5	236.6	231.0	231.8	233.8	0.75
n-C36	226.3	227.3	225.1	227.3	230.8	224.0	224.8	227.3	0.94
n-C38	214.6	215.0	213.3	215.1	218.7	212.4	213.3	215.9	0.91
n-C40	222.7	227.9	226.4	227.9	231.8	226.2	227.0	230.7	0.88

This shows the reproducibility when 50 μ l of n-C10 to n-C40 in Hezane was injected and analyzed 8 times consecutively. Good reproducibility can be obtained, with all RSDs at n=8 being less than 1%.

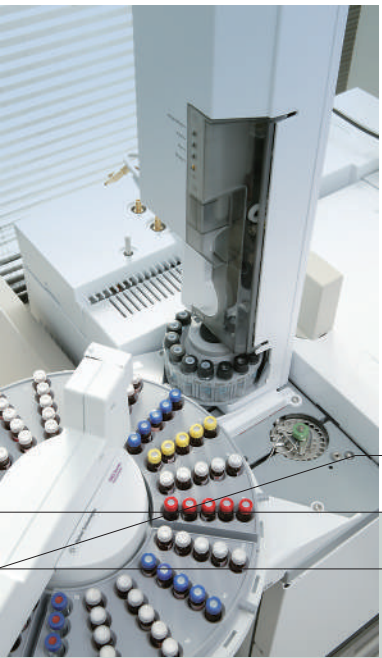


□ GC conditions

- Injector...LVI-S250
- Injector Oven Temp...70°C-120°C/min-290°C(22min)
- Solvent Purge Time...18sec
- Auto-Sampler...AT7683
- GC/MS...AT6890N
- Column...DB-5MS 0.25mm \times 20m,0.25 μ m
- Column Oven Temp...50°C(5min)-15°C/min-350°C(2min)
- Detector Temp...320°C
- Detector...FID
- Split/purge Flow...150mL/min
- Splitless Time...4min
- Injection Volume...50 μ l

□ LVI-S250 Auto sampler installation example

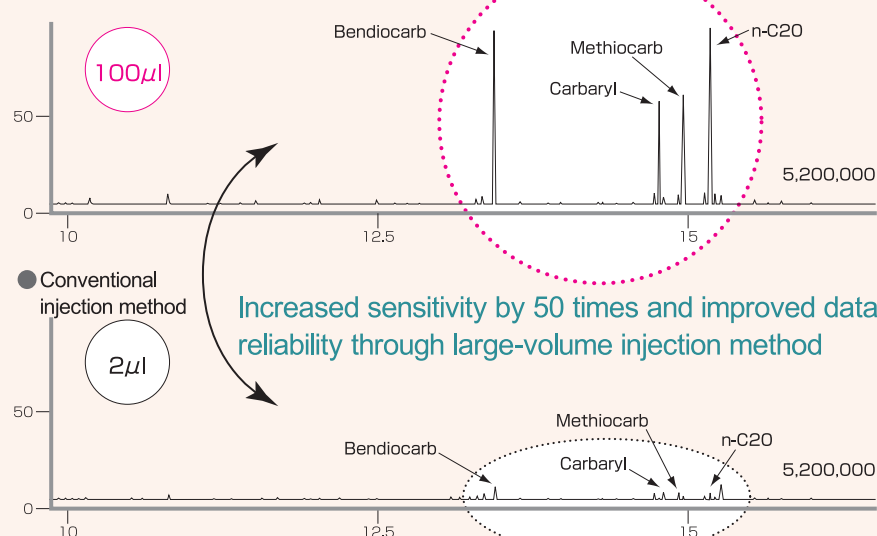
Large quantities can be injected using existing autosamplers.



Application Microchemical analysis

LVI-S250 facilitates large-volume injection.
High sensitivity performance 10 to 100 times higher.
Achieve improved data reliability.

the large-volume injection method



A chromatogram obtained by injecting the same sample with a normal injection volume of 2 μl and a chromatogram obtained with a large volume injection of 100 μl. In a chromatogram obtained by injecting 2 μl, the peaks overlap with noise, making qualitative and quantitative determination difficult, but in a chromatogram obtained by injecting a large amount, qualitative and quantitative determination is easy. If the sensitivity is insufficient in trace analysis, the large volume injection method can improve the sensitivity by 10 to 100 times. Moreover, the reliability of the data will be increased.

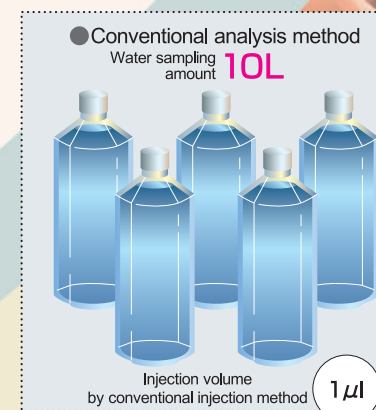


Large amount of sample

Handling large amounts of samples

In the analysis of dioxin in waste water

For analyzes that require a large amount of sample, such as dioxin analysis in wastewater, using the large-volume injection method can reduce the amount of sample to 1/50, making pretreatment quick and easy.



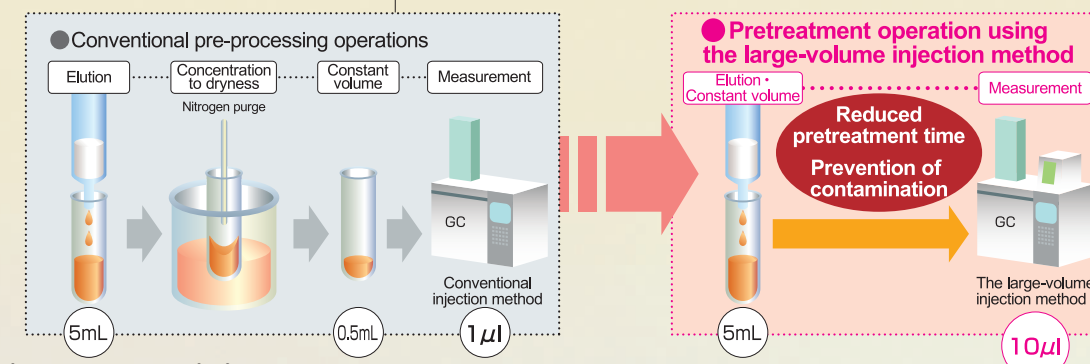
Sample amount reduced to 1/50!!

Simplification of concentration operation

Increase work efficiency by using the large volume injection method

Prevent contamination by reducing operating processes

By using the large volume injection method, work efficiency is greatly improved. It is possible to omit the pretreatment process of concentration operation using an evaporator or nitrogen purge, which used to take a long time.



Faster pretreatment

Reduced effort & costs

Improving analysis accuracy

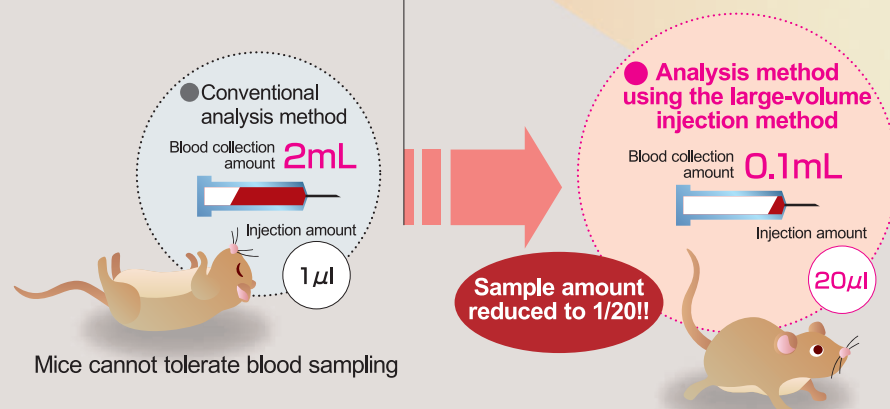
Highly sensitive analysis that performs under various conditions.

Small amount of sample

Application to samples with a limited amount of collection

For bioanalysis using small animals such as mice

By using the large-volume injection method, analysis can be performed even with limited sample amounts, such as in animal experiments such as mice. What's more, it is also possible to observe changes over time in a single mouse.



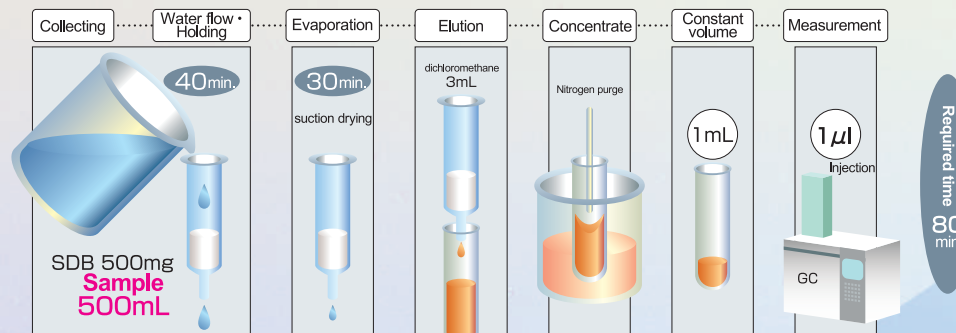
Reduced pre-processing time

Responding to underwater pesticide analysis such as environmental analysis with many samples

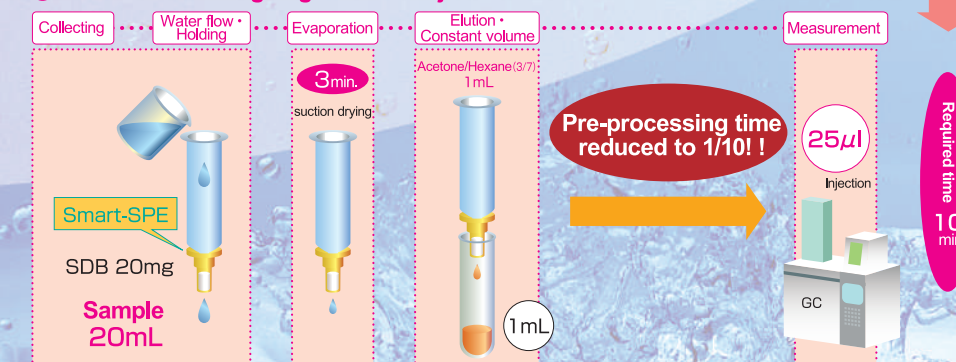
Comparison of pretreatment time between conventional and the large volume injection methods

In analyzes that require a large amount of samples, such as environmental analysis, using the large-volume injection method can reduce the amount of samples to 1/10 to 1/100. This significantly shortens the water flow time, and by reducing the amount of solid phase packed, it is possible to shorten drying time and reduce the amount of elution. Moreover, since the volume can be fixed at the same time as elution and measurement can be performed as is, it is possible to significantly shorten pretreatment time overall.

Conventional pretreatment



Pretreatment using large-volume injection method

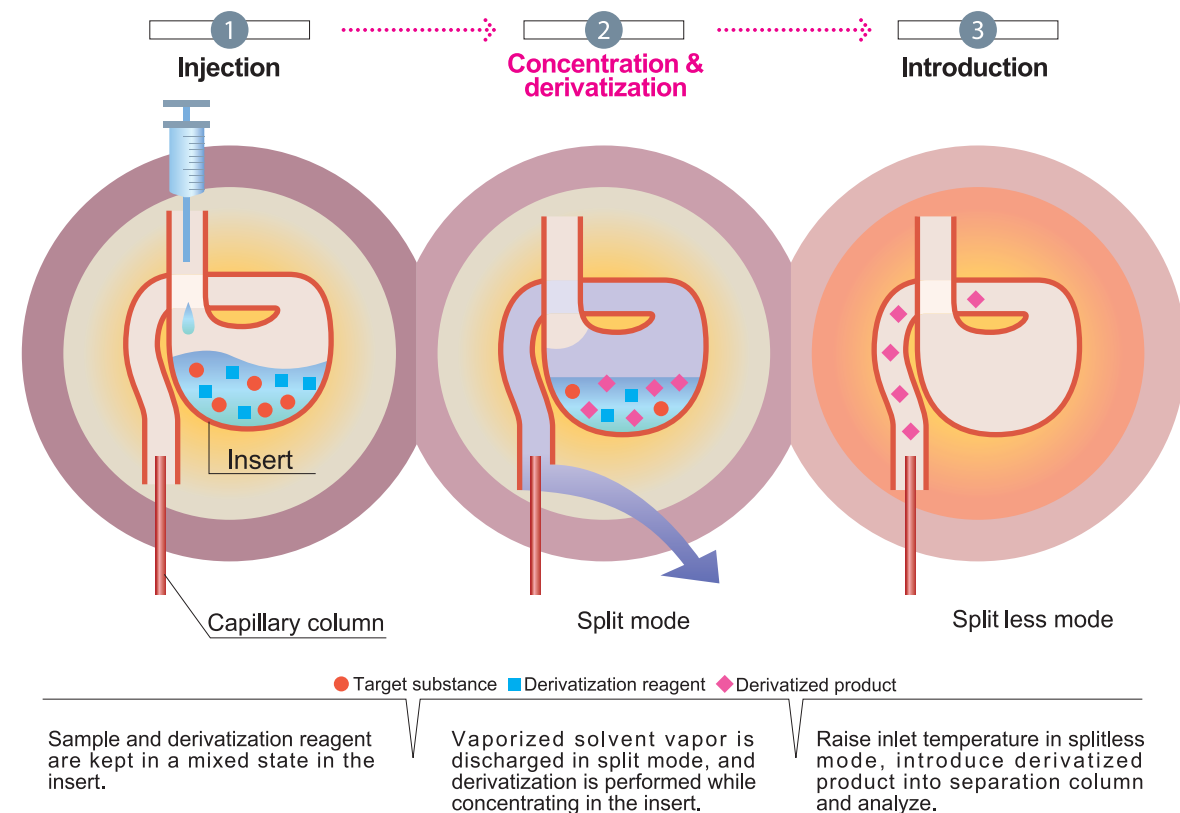


APPLICATION

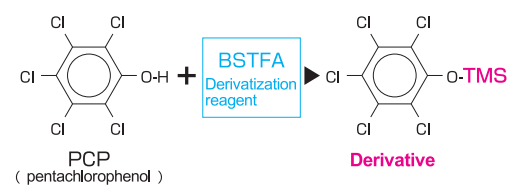
Derivatization

Derivatization injection method

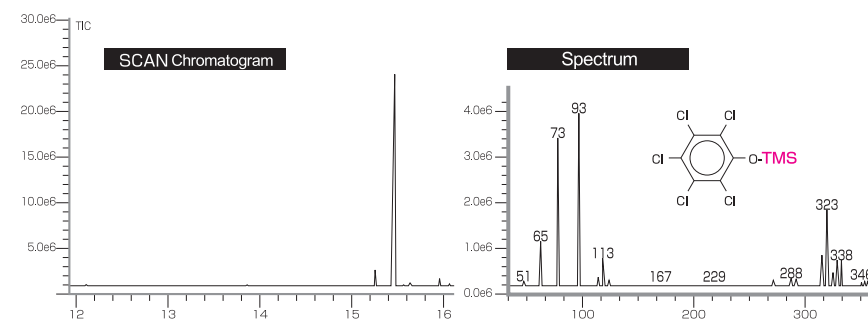
Efficient derivatization is achieved while concentrating with a stomach-shaped insert.



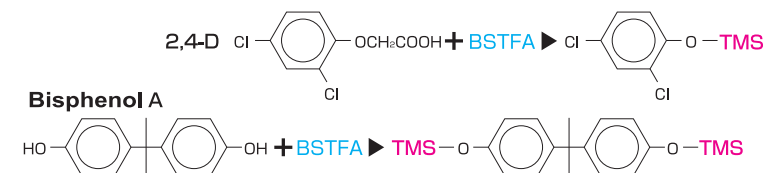
Derivatization



We evaluated the derivatization injection method using pentachlorophenol as the sample and 1% BSTFA as the derivatization reagent. From this SCAN chromatogram and spectrum, we found that derivatization was definitely occurring within the insert.



2,4-D, Bisphenol A TMS conversion



Injection method

Compatible with various injection methods including large-volume injection.

- ☐ Split injection
- ☐ Split less injection

By injecting at a slightly lower temperature and then raising the temperature, the effects of discrimination can be prevented.

- ☐ Cold split injection
- ☐ Cold split less injection

Since wool with many active points is not required, the original effect of the PTV inlet can be obtained.

- ☐ On-column injection

This method involves inserting the syringe needle directly into the column and injecting the sample in a liquid state. Use on-column inserts.

- ☐ Large injection

It is possible to inject 1 to 200 µL in one injection. If you use the repeated injection method and slow injection method, even 1 mL can be injected.

- ☐ Derivatization injection



Differences from conventional shape
(Left: New type insert / Right: Conventional product)

Easy maintenance

LVI-S250 insert replacement

If you loosen the screws that fix the upper lid, the upper lid will come off, so use tweezers to replace the insert. Although it has a complex shape, inserts can be replaced very easily.



Flexible, efficient analysis. Supports various injection methods.

Controller box

Easy to operate with touch panel system.



This device can be controlled from a touch panel using a single controller. This is especially useful if you want to change the inlet temperature directly. 200 methods and 20 sequences can be recorded on the controller itself. Additionally, the color of the LCD panel indicates the status of this device, and in the event of an error, a buzzer sounds and a message is displayed.

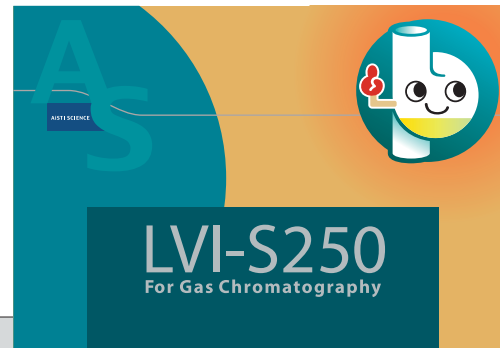


Initial setting PC control screen Error screen

*Touch panel operations cannot be performed when controlling from a PC (when using software).
*Displayed content may differ from the actual product.

SOFTWARE

Setting by software



We provide solutions to support your operations demands.

LVI-S250 communication software is dedicated software that allows you to perform various controls from a personal computer with easy operation and a rich set of functions. Creating and editing method and sequence files, controlling constant temperature operation, repeat operation, sequence movement, and checking logs. Equipped with printing function. Compared to touch panels, there is no limit to the number of method and sequence files that can be created, and comments and creation dates and times are also recorded. It has excellent operability, allowing you to check information such as communication status, operating mode, operating status, and current temperature all at once, as well as displaying the inlet temperature in a graph. In addition, when creating a method, recommended values for the initial inlet temperature and solvent drain time are displayed depending on the injection method and solvent used, making method creation easier. You can also print each information from a printer connected to your personal computer and manage it on paper.

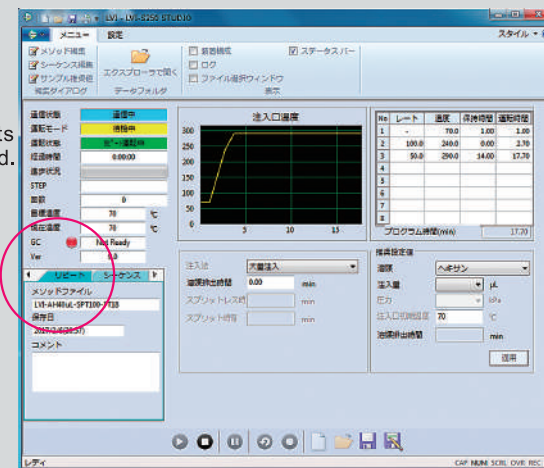
Constant temperature operation

Used when setting a constant temperature and injecting repeatedly using traditional injection methods such as splitless injection. The temperature setting range is 40°C to 300°C.



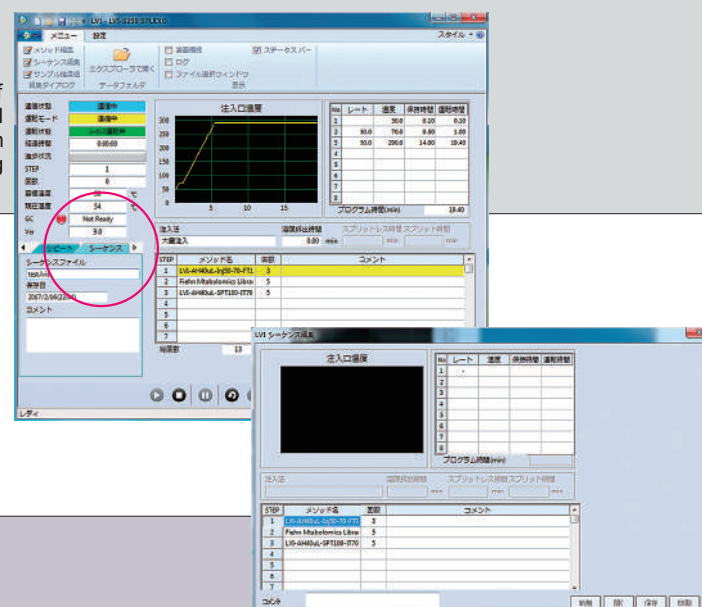
Repeat operation

Used when performing repeated measurements using one created method.



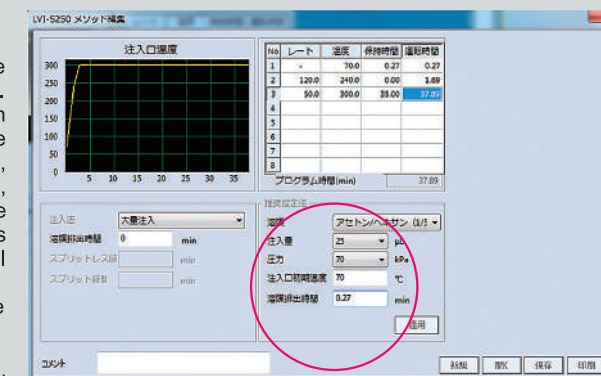
Sequence operation

Use this to set the number of measurements for each method file you have created and perform continuous measurements using different methods.



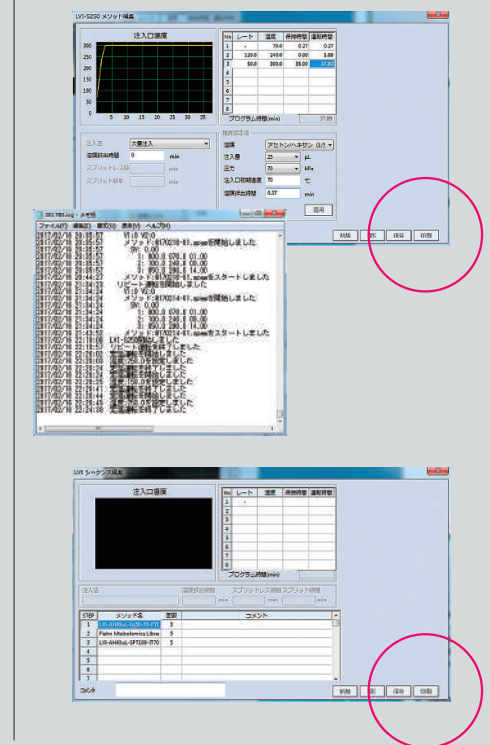
Method editing

Create a method on the method editing screen. After setting the injection method and selecting the solvent, injection volume, and pressure for injection, the initial inlet temperature and recommended values for solvent discharge will be displayed. You can easily create methods based on recommended values. Method files created by method editing are used for repeat operations and sequence operations.



Print function

It is possible to print set methods and sequences, as well as operation logs and error logs.



Driving log & error log

Records of past driving and errors that occurred in the past are saved and can be checked. This will help you troubleshoot if a problem occurs.

