PromoChrom Technologies

Instrument Catalog

2010 - 2011

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SPE-01 Plus Cleanup Station

SPE-01 plus cleanup station is designed for sample preparation in trace analysis of food and environmental samples. By automating the tedious cleanup procedures, SPE-01 plus helps to increase the sample throughput and improves the quality of analytical results.

The instrument can handle up to 9 samples per batch without attendance. Up to 5 solvents can be used for column conditioning and multi step elution. Two fractions can be collected for each sample. These features make SPE-1 plus an ideal tool for sample preparation in multi residue analysis.

1. Features

1.1 Easy operation

SPE-01 plus uses built-in methods for automatic column cleanup. The method can be easily edited and can be saved for repeated use. The operation of instrument involves only 7 buttons.

Below are typical routine operation procedures:

- Place sample probes in samples
- Place columns and receiving tubes
- Choose/edit method
- Select samples
- Press the start/stop button

The instrument will process samples one by one till all of the samples have been cleaned up. The touch screen LCD makes operation of the instrument easy and fast.

1.2 Full automation

SPE-01 plus can automatically fulfill the following actions:

- Pre-condition of columns
- Sample loading
- Multi-step elution to remove sample matrix
- Blowing air through the column to dry the sorbent
- Multi-step fraction collection
- Detection and smart handling of column blockage

When the instrument detects a blockage in column, it will automatically reduce the flow rate. Only when the problem cannot be solved by using lower flow rates, the instrument will go to the pause mode. The process can resume after the blockage is removed. It is not necessary to start all over again.

1.3 Small footprint and computer-free operation

The instrument has a small footprint and does not need a computer. It helps to save precious laboratory space. When volatile or toxic solvents (such as hexane, acetone, and petroleum ether) are used in sample preparation, the instrument can be conveniently placed in a fume hood.

1.4 Easy transfer of existing manual methods

Below is an example of methods for SPE-01 plus:

Line #	Action	Flow rate	Volume
1	Elute with 2	15	5.0
2	Elute with 1	15	10.0
3	Add sample	6	20.0
4	Elute with 2	6	5.0
5	Collect to 1	6	5.0
6	Elute with 3	10	10.0
7	Collect to 2	6	10.0

The format is very similar to manual methods. Any manual procedure for column cleanup can be conveniently transferred to an instrument method.

2. Applications

2.1 Column cleanup for analysis of drug and pesticide residues in food samples

Traditional column cleanup uses glass columns packed with silica gel, alumina, or Florisil. Now pre-packed solid phase extraction cartridges are getting popular.

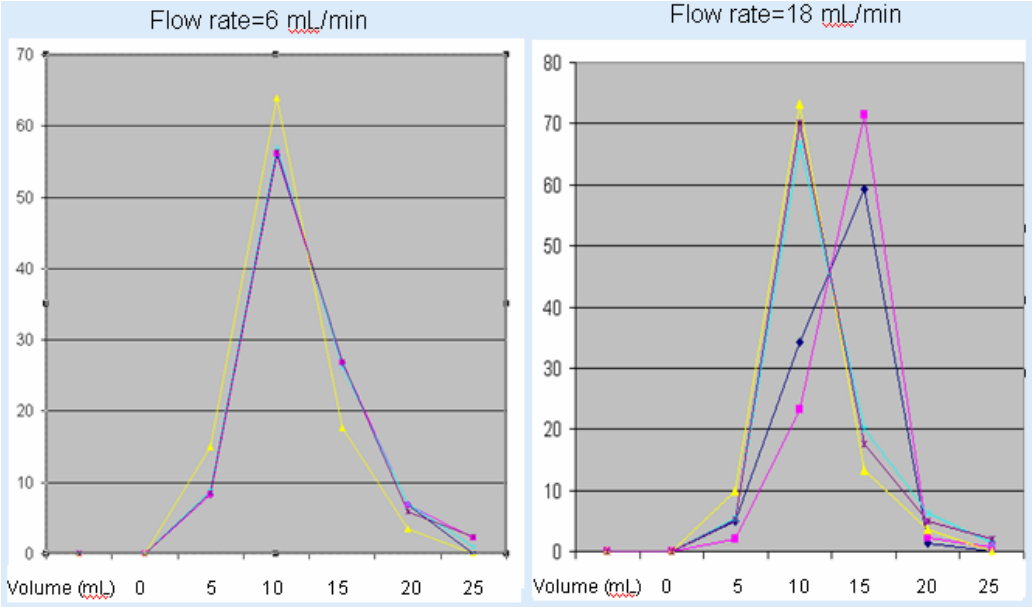
A typical clean up method involves pre-conditioning of column using a strong solvent (such as acetone) followed by a weak solvent (such as hexane). After adding the sample, columns are first eluted with a weak solvent to remove lipids and other low polarity components from sample matrix. The strength of elution solvents can then be increased stepwise. In handling multi-residue analysis, pesticides of different polarity may be collected into two fractions. Existing methods can be easily modified and used for SPE-01 plus automation process.

Since it is hard to control the flow rate and volume of solvents, the repeatability of manual SPE is not satisfactory and is mainly used for simple clean up. SPE-01 plus can control flow rate accurately and helps to improve reproducibility of the analysis. With SPE-01 plus, users can do multi step elution using up to 5 solvents. Therefore, the instrument is very useful for the clean up of complex samples and especially for the simultaneous analysis of multi-residues.

2.2 Accelerated elution (Flash column chromatography)

The flow rate in manual column cleanup is limited by gravity and particle size of the sorbent. In addition to unstable flow rate, the elution cannot be accelerated. In organic synthesis field, column chromatographic purification has seen a drastic improvement after introduction of flash HPLC which uses higher flow rate and sorbent of smaller particles. However this technique is seldom used for sample cleanup in trace analysis due to the lack of suitable automated cleanup instruments.

The performance of the pump in SPE-01 plus is comparable to the pump used in a flash LC. It can deliver a flow rate up to 20 mL/min. The high output pressure also allows to use smaller particles (10-20 um) to improve the column efficiency. Below is an example of its application for pesticide residue cleanup in tea.



Elution pattern of 5 pyrethroid insecticides on column packed with 3 gram florisil (fenpropathrin, cyhalothrin, cypermethrin, denvalerate, deltamethrin). Data provided by Tea Research Institute, Chinese Academy of Agric. Sci.

As shown in the above figures, elution pattern at 18 mL/min is similar to that at 6 mL/min (near the flow rate in manual column cleanup). A much faster elution speed can be achieved in automated column cleanup.

Currently the particle size of packing material for SPE cartridges and column chromatographic cleanup is normally of 40 um and above. Although it is known that a smaller particle gives better separation efficiency and reduces elution volume in chromatography, it is not practical in manual operation as the liquid will have problem flowing out. With the introduction of SPE-01 plus, it becomes possible to use columns with smaller particles.

3. Specifications

Sample capacity	9 per batch
Volume of sample	1 to 500 mL
Material of wetted parts	Teflon, PEEK, Pyrex glass
System control	Micro controller with touch screen LCD as interface
Method	Permanent storage of 3 methods
Pump flow rate	1 to 20 mL/min
Precision of pump	CV < 1.5%
Power supply	24 VDC
Current	< 1 A
Weight	12.5 kg
Dimension	34 x 34 x 45cm (width x depth x height)

4. Ordering Information

Part Number	Description	Price (US$)
SPE-01-02	Includes SPE-01 plus mainframe, 24V power supply, collection tray, adapter for 3-mL and 6-mL columns, and user manual	

SPE-03 4-Channel Cleanup Station

SPE-03 4-channel cleanup station is designed for automatic solid phase extraction of large volume water samples. It has four pumps to handle four samples simultaneously. By providing constant flow rate and well controlled elution procedures, SPE-03 helps to improve quality and efficiency of water analysis and release chemists from tedious sample preparation routines.

1. Features

1.1 Easy operation

SPE-03 uses built-in methods for automatic extraction. The methods can be easily edited and saved for repeated use. The operation of instrument involves only 7 buttons. Below are typical routine operation procedures:

- Place sample inlet probes in samples
- Place columns and receiving containers
- Select method
- Press start/stop button

The instrument will process the samples automatically according to the method.

1.2 Blockage detection and smart handling

When columns are blocked by particles, the system can detect the blockage and reduce the flow rate accordingly. If blockage still occurs at the minimum flow rate, the instrument will pause to wait for human attendance.

1.3 Small footprint and computer-free operation

The instrument has a very small footprint and does not need a computer. It helps to save precious laboratory space. When volatile or toxic solvents (such as hexane, acetone, and petroleum ether) are used, the instrument can be conveniently placed in a fume hood.

1.4 Different flow rate for each elution steps

Different flow rates can be set for column conditioning, sample loading, and elution. Procedures that are not sensitive to flow rate (e.g. conditioning and blow dry) can use higher flow rate to save time.

1.5 Separate collection of water waste and solvent waste

SPE-03 collects water waste and organic solvent waste in different containers. This feature helps to protect our environment and reduce cost in waste treatment.

2. Specifications

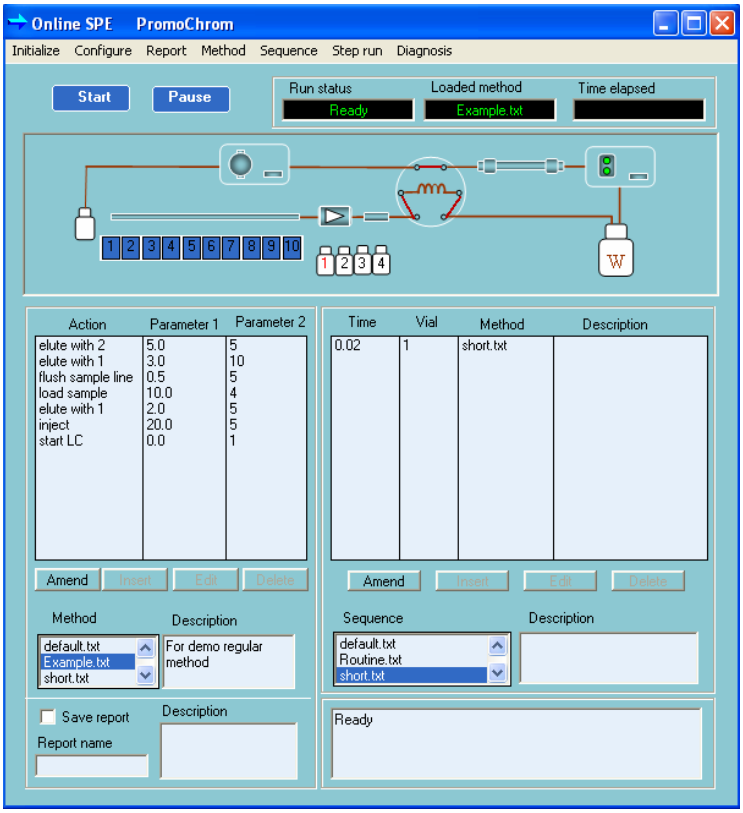
Sample capacity	4 per batch
Volume of sample	1 to 4000 mL
Material of wetted parts	Teflon, PEEK, Pyrex glass
System control	Handheld controller
Method	Permanent storage of three methods
Method functions	Pre condition, load sample, elution with 5 solvents, blow dry of sorbent, fraction collection
Pump flow rate	1 to 20 mL/min
Pressure limit of pump	6 bar
Pump reproducibility (C.V.%)	<1.5
Power supply	24 VDC
Current	< 1 A
Weight	10 Kg
Dimension (cm)	30 x 31 x 40 (width x depth x height)

3. Ordering Information

Part Number	Description	Price (US$)
SPE-03-01	Includes SPE-03 mainframe, handheld controller, 24V power supply, collection tray, sample inlet head with filter, adapter for 3-mL columns, and user manual	

Online SPE and Between Column Derivatization

Online SPE helps to improve efficiency and data quality by integrating sample preparation with LC and LC-MS analysis. It comes with two configurations: one for online SPE and the other for between column derivatization (BCD).



1. Working principle

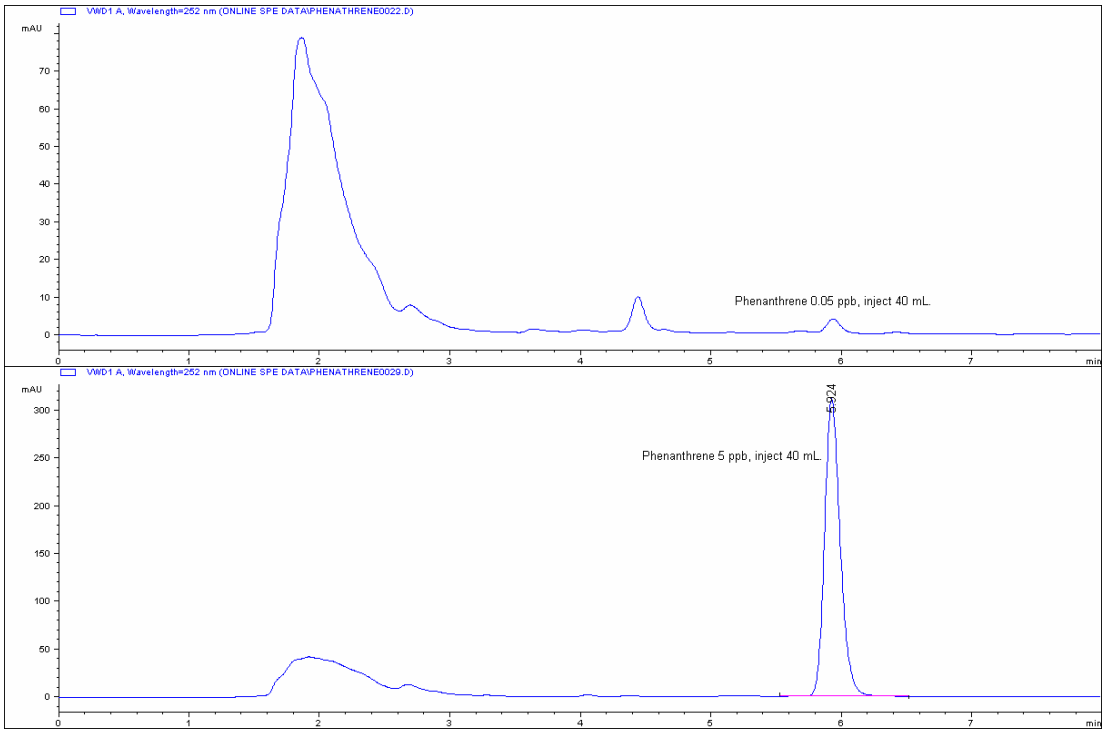
The online SPE uses valves and a syringe pump to transfer sample to SPE column and then to the HPLC system. For the configuration with BCD, a heated reactor is added. Samples eluted from a SPE column is first diverted to the reactor. Derivatization reagents (two types) are added. The derivatization reaction occurs under controlled temperature. A portion of the reactant liquid is then transferred to the sample loop in the injection valve and then introduced to the analytical column.

The control software looks after the detailed valve switches. Users only need to select the necessary actions, such as “load sample”, “add reagent 1”, “inject”, “start LC”, etc. The device uses remote signal to trigger start of HPLC. While the HPLC is running a sample, online SPE can carry out extraction of next sample. The overlapped introduction saves the time for sample preparation.

2. Applications

2.1 Direct analysis of pollutants in water

Below is an example for direct analysis of polycyclic aromatic hydrocarbons (PAH) in tap water at ppt level. A 40-mL tap water is analyzed directly. Since the whole portion of the sample is injected to the analytical column, the detection limit can go down to 5 ppt without using fluorescence detection. By using the overlapped injection feature, the processing time for one sample is only 15 minutes.



Direct analysis of phenanthrene in tap water at 5 ppb and 50 ppt level using online SPE coupled with HPLC. SPE column, TrapN; analytical column PromSil C18; sample volume, 40 mL; flow rate for sample loading, 6 mL/min; detection wavelength, 252 nm.

In an offline approach, normally 500 to 1000 mL water need to be extracted. Further concentration and solvent exchange are followed before the instrument analysis. Only a very small portion of the concentrated sample is injected to the HPLC. To achieve similar detection limit of online SPE, a 4-liter water need to be extracted. The processing time for one sample is above 1 hour.

Another advantage of online SPE over offline SPE is its good reproducibility. Since online SPE involves less procedures than the offline approach and all these procedures are controlled by instrument, the chance of error is much less. Even at 0.05 ppb level, the %RSD is only 2.5 (n=3).

Therefore, if the pollutant can be analyzed by HPLC, the online approache should be used.

The key for a successful application of online SPE is the selection of a suitable SPE column and the analytical column. To simplify the method development, PromoChrom provides two method kits with well matched SPE column and the analytical column. They also include the method parameters for most common analysis. By slightly adjusting the parameters, users can easily development their own methods.

2.2 Between column derivatization

Derivatization is necessary for HPLC or LC-MS analysis when the analytes do not have good detection sensitivity or are not suitable for chromatographic separation. Among the examples of analytes are amino acids, aldehydes, hormones, and carbamate pesticides.

Currently two types of online derivatizations are used: pre-column derivatization (PreCD) and post-column derivatization (PostCD). PreCD normally can be done using a programmable auto sampler and thus the cost is lower than PostCD. PostCD normally involves a derivatizer with functions of reagent delivery and temperature controlled reaction chamber. It is normally more tolerant to interferences from sample matrix and tends to give better reproducibility. On the other hand, PostCD is more costly than PreCD.

Between-column derivatization (BCD) helps to overcome the disadvantages in PreCD and PostCD. In a BCD approach, samples first enter a pre-column for clean up and enrichment. The analytes are then transferred to a temperature controlled reaction chamber for derivatization. The derivatized analytes are then transferred to the analytical column for separation and analysis. Compared to PreCD, BCD can give better reproducibility as it can control the temperature of reaction and remove sample matrix which may interfere with the derivatization reaction. The BCD approach uses a specially modified auto sampler and the cost is lower than a post-column derivatizer. As the addition of derivatization reagent is not continuous, the consumption of reagent is much less than PostCD.

3. Specifications

Number of samples	10 for Online SPE; 6 for BCD
Volume of sample (mL)	1-100
Number of elution solvents	4
Pump reproducibility (C.V.%)	< 1.5
Temperature for reaction	Ambient to 80 ℃ (for BCD only)
Type of derivatization reagent	2 (for BCD only)
Material of wetted parts	Stainless steel, Teflon, PEEK, special glass
System control	Software via computer
Power supply	24 VDC
Current	< 1 A
Weight	5.5 Kg
Dimension	34 x 40 x 28 cm (width x depth x height)

4. Ordering Information

Part Number	Description	Price (US$)
LC-03-01	Online SPE	
LC-03-02	Online SPE with between column derivatization function	
LC-03-03	Method kit for compounds of low polarity (Include 5 TrapN SPE column, one analytical column, and methods)	
LC-03-04	Method kit for compounds of high polarity (Include 5 TrapP SPE column, one analytical column, and methods)	

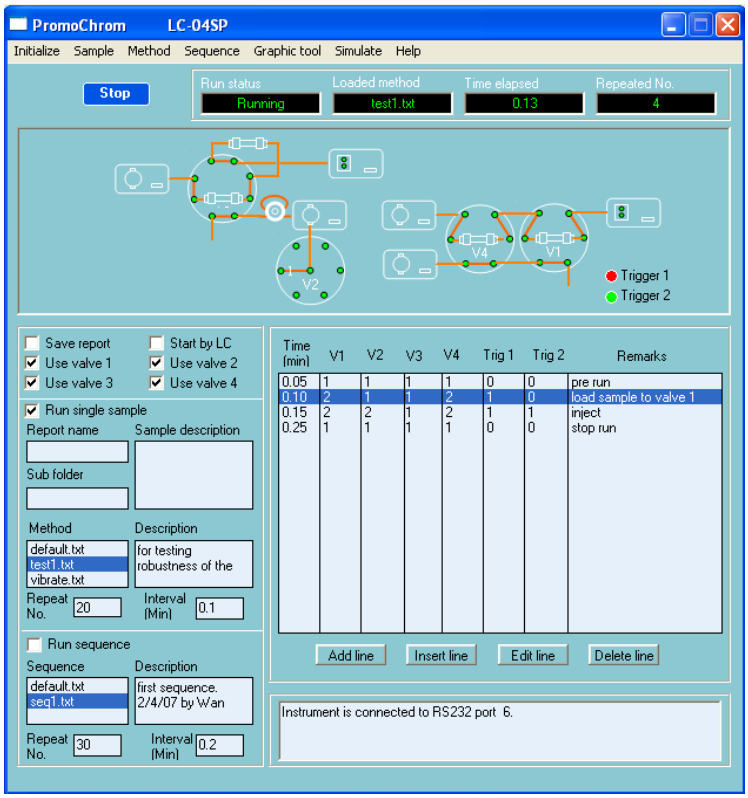
LC-04SP Valve System

LC-04SP valve system provides a versatile platform for building valve based solutions. It can have up to 4 valves. Each valve can be a 2-position/6-port valve, a 2-position/8-port valve, a 2-position/10-port valve, a 6-position stream selection valve, or a 10-position stream selection valve.

1. Features

The most outstanding feature of LC-04SP is its editable valve diagram. The software provides a drawing tool box. Users can design and edit the valve diagram according to their applications and the real valve connections. The software will memorize the diagram.

The other special feature of LC-04SP is its high flexibility. Users can choose the number and type of valves according to their needs and can add more valves later.



LC-04SP can have one or two modules and each module has two valves. It communicates with computer through a RS-232 port or a USB port using a RS-232 converter. The second module communicates with computer through the first module using a Y-cable. Each module has a remote port to obtain start/stop signals from other analytical instruments (such as LC-MS, HPLC, or GC). It also has a trigger port to trigger start and stop of other devices, such as pumps or samplers.

LC-04SP can work with any HPLC and LC-MS that can provide a contact closure or a TTL output. The remote port on LC-04SP can sense the start/stop signals from other instruments to make synchronized run with the analytical instruments. LC-04SP also has 2 output triggers to trigger start and stop of other devices. This function may be used to start a loading pump for online sample cleanup or to trigger the HPLC system for automatic run (it can be very useful when the HPLC does not have an auto sampler and otherwise has to be started manually).

2. Specifications

Switching valve	
Material of wetted parts	Stainless steel, Valcon H (carbon fiber reinforced PTFE)
Pressure limit	5,000 psi (liquid)
Switch time	<120 ms for 2-position valves, <150 ms per step for stream selection valves
Solvent mixing valve	
Material of wetted parts	Teflon and PEEK
Switch time	<3 ms
System	
Communication with PC	RS232
Power supply	24 VDC
Current	< 1 A
Remote interface	TTL signal or contact closure for input; TTL output
Weight	2 Kg
Dimension	20 x 21 x 10 cm (width x depth x height)

3. Ordering Information

LC-04SP may be ordered as one or two modules. Each module may have one or 2 valves. Each module includes a RS-232 cable for PC communication and a CD carrying control software and user manual. When two modules are ordered together, a Y-cable is included for connection between the modules.

Part Number	Description	Price (US$)
LC04-1-2P6P	First 2-position/6 port valve	
LC04-1-2P8P	First 2-position/8 port valve	
LC04-1-2P10P	First 2-position/10 port valve	
LC04-1-6P	First 6-position stream selection valve	
LC04-1-10P	First 10-position stream selection valve	
LC04-2-2P6P	Add one more 2/6 valve	
LC04-2-2P8P	Add one more 2/8 valve	
LC04-2-2P10P	Add one more 2/10 valve	
LC04-2-6P	Add one more 6 P stream selection valve	
LC04-2-10P	Add one more 10 P stream selection Valve	
LC04-04TK	Tubing kit	

LC-05 Auto Injector

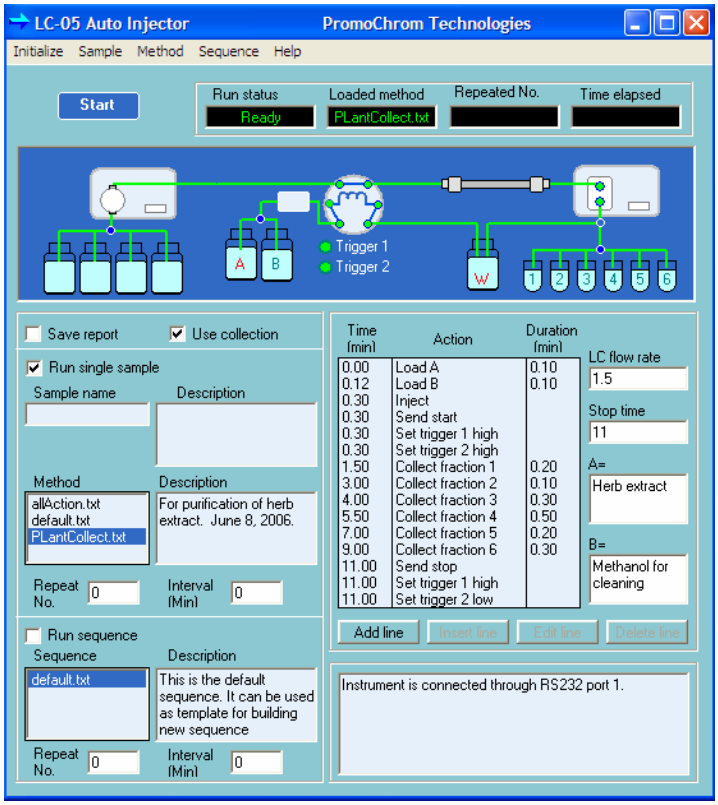
LC-05 Auto Injector is for automatic introduction of samples from a fixed source. Typical applications are online monitoring. It enables a normal HPLC to fulfill tasks that cannot be done using a HPLC auto sampler.

By adding a valve based fraction collector, large scale purification can be achieved using an analytical scale HPLC.

LC-05 Auto Injector is designed to work with any type of HPLC instruments. Its versatile interface makes the integration easy and fast. The user friendly and powerful software provides highly automatic and reliable control.

1. Working principle

The injector consists of a divert valve, a load pump, a high-pressure switch valve, and the control software. The divert valve makes selection between two sources for injection. For on-line analysis, one source can be the sample and the other source can be the calibration solution. In case of repeated injection for large scale purification, the two sources can be two samples. The load pump is used to deliver sample to the sample loop. The pump can deliver very accurate volume, since the volume per cycle is fixed and the number of cycles is controlled by the software. The switch valve is used to connect the HPLC pump to the sample loop for injection.



The user interface of the control software

The diagram of the software not only demonstrates the working principle but also serves as a graphical user interface. The software provides two types of control for the injector. The components of the injector can be directly switched by clicking on the relevant icons in the diagram. A second click can stop the pump. For a more automatic control, methods or sequence can be used. The software monitors the status of the injector and the HPLC regularly. The status is reflected in the diagram for easy observation. For example, when the switch valve changes from inject position to load position; its connection diagram is updated for the new position. If the switch valve goes out of control, a warning message and help tips will be given in the notice panel. The analysis will be paused. The injector will also monitor the status of HPLC through a remote cable. It will start a run only when the HPLC is ready for analysis.

2. Specifications

Injection valve	
Material of wetted parts	Stainless steel, Valcon H (carbon fiber reinforced PTFE)
Pressure limit	5,000 psi (liquid)
Switch time	<120 ms
Sample loop	Specify when order (5 uL to 10 mL)
Loading pump	
Material of wetted parts	Teflon and PEEK
Flow rate	4 mL/min
Accuracy (C.V.%)	2%
Repeatability (C.V.%)	1%
Maximum outlet pressure	5 psi (0.35 bar)
System	
Communication with PC	RS232
Power supply	24 VDC
Current	< 1 A
Remote interface	TTL signal or contact closure for input; TTL output
Weight	2 Kg
Dimension	25 x 23 x 11.5 cm (width x depth x height)

3. Ordering Information

Part Number	Description	Price (US$)
LC05A	LC-05 Auto injector	
LC05A-01	LC-05 Auto injector with fraction collector	

LC-05 Plus Online Injector

LC-05 Plus online injector is designed for process monitoring and optimization in pharmaceutical and chemical industries. The online injector works with an Agilent 1200 HPLC for online monitoring of reaction progress. It provides a more reliable control on the product quality and helps to improve the production yields by providing a timely harvest indication.

1. Working principle

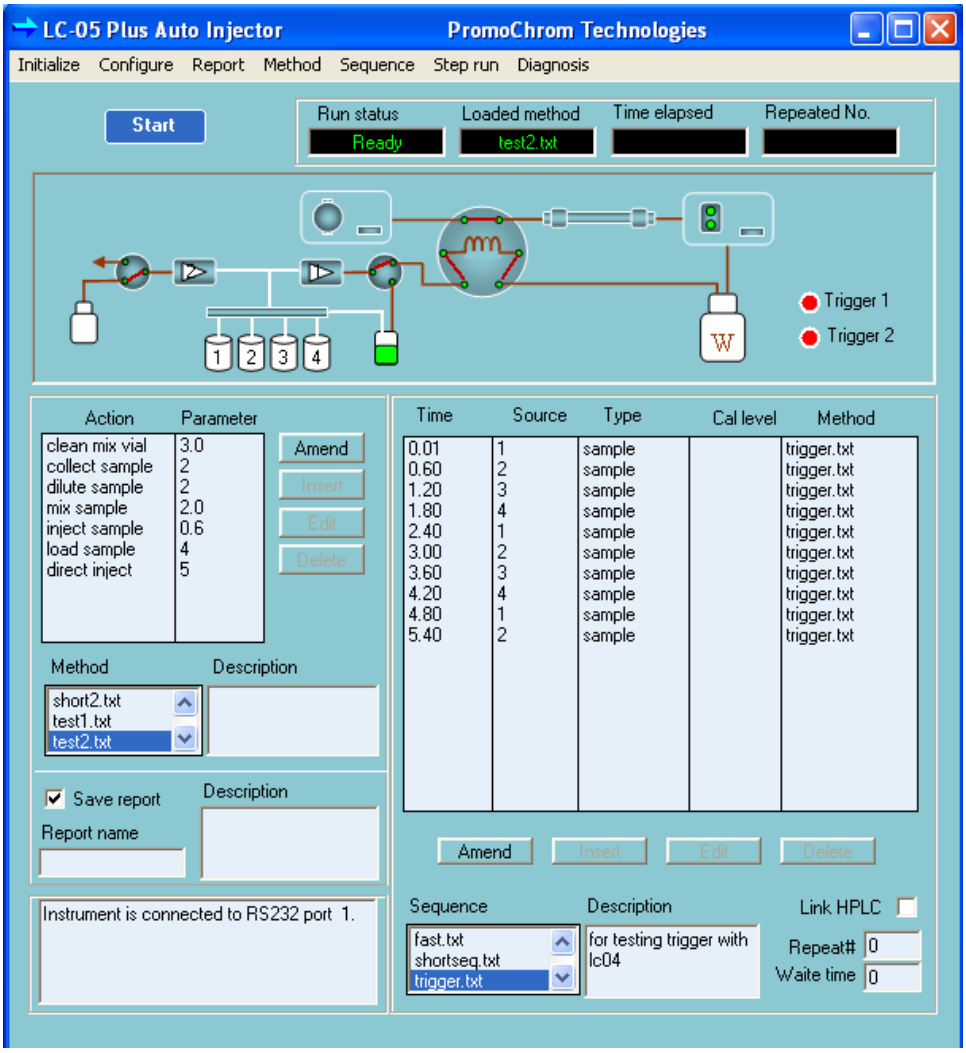
A typical working cycle includes following steps:

1) Collect and filter a sample from a site (a reaction vessel or a calibration standard).
2) Dilute the sample to make the media compatible with the HPLC mobile phase and the concentration suitable for the HPLC detector.
3) Load the sample to the loop of the injection valve.
4) Export the sample information (such as sample source, type, collection time, and data file name) to the Chemstation sequence table.
5) Check the status of the HPLC. Start HPLC analysis when the HPLC is ready.
6) Clean the dilution vial and the sample line.

All the above procedures are carried out automatically using methods or sequence. Users do not need to know the real valve and pump switches.

The integration of the online injector with Agilent HPLC is based on dynamic data exchange. There are no cables involved. The injector also provides an injection port to allow manual introduction of calibration standard for HPLC calibration.

The software monitors the status of the injector and the HPLC regularly. The status is reflected in the diagram for easy observation. For example, when the switch valve changes from inject position to load position, its connection diagram is updated for the new position. If the switch valve goes out of control, a warning message and help tips will be given in the notice panel. The analysis will be paused. The injector will also monitor the status of HPLC through a remote cable. It will start a run only when the HPLC is ready for analysis.



The user interface of the control software

2. Ordering Information

Part Number	Description	Price (US$)
LC-05-01	LC-05 plus online injector (4 sampling points)	
LC-05-02	LC-05 plus online injector (1 sampling points)	

LC-051 Sample Collector

LC-051 online sample collector can collect samples from up to 4 sites. The fraction collection is based on stream selection valves and can have up to 18 fractions. Since the system does not use XY motion control, the receiving containers can have any shape and volume.

1. Features

The most outstanding feature of the online sampler is its computer free operation. It saves space and cost of a computer. It also enables the device to be placed near the sampling site.

The device can store two methods and a sequence for automatic operation. Although the online sampler involves two pumps and many valves, the commands of a method is simple, such as “collect”, “dilute”, etc. The device will look after the operation of the relevant pumps and valves according to the method command.

The online sampler can work as a control master and use the sequence to decide sampling location, collection time, and the collection position. It can also work as a slave and carry out sample collection at the request from other devices (such as the reaction vessel controller or a pH sensor). The communication with other devices is through two ports with 2 digital outputs and 4 digital inputs. The integration is easy and fast.

2. Ordering Information

Part Number	Description	Price (US$)
LC-051-01	LC-051sample collector (4 sampling point)	
LC-051-02	LC-051 sample collector (1 sampling point)	

LC-08 Column Selector

LC-08 column selector can make column change with a button press or using built-in method. It eliminates hassles in manually changing HPLC columns and improves efficiency and reliability in analysis.

1. Features

1.1 Easy to use

Using only 6 buttons, users can program the column selector according to their needs. The method and sequence are permanently stored.

1.2 Full automation

The built in method and sequence enable automatic column switching within a run or between runs. Computer is not necessary for many applications.

1.3 Easy integration with HPLC instruments

LC-08 column selector can synchronize with an HPLC according to its start/stop signals. It can also work as a control master to control the start and stop of an HPLC. The latter function is very useful when the HPLC do not have automatic start capability.

2. Applications

1) Direct column switch by pressing the up and down buttons. It eliminates all the troubles in manual column change.
2) Use different columns in a batch of analysis.
3) Screen for right columns in method development. Several columns can be tested one by one without attendance.

3. Specifications

Power supply	24 VDC
Current	< 0.5 A without temperature control; < 1.0 A with temperature control
Valve switch time	< 150 ms per step
Pressure limit	5,000 psi (345 bar)
Number of column	6
Temperature	Ambient to 70 ^{o}C
Weight	3 Kg
Dimension	23 x 27 x 34 cm (width x depth x height)

4. Ordering Information

Part Number	Description	Price (US$)
LC-08-01	LC-08 column selector without temperature control	
LC-08-02	LC-08 column selector with temperature control	
LC08TK	Connection kit for column selector. Include fittings and tubing for 6 columns.	

HPLC Pumps

PromoChrom offers high quality pumps for working together with its valve products. These pumps have very small foot print and can be easily accommodated into an existing HPLC system. They come with RS-232 port and can be controlled by the LC-04SP software. They can be used as secondary pump for 2D-LC or on-line SPE. They can also be used to build an economical purification system by working with a LC-05 auto injector or a LC-04SP valve system.

1. Feature of HPLC Pumps

1) Compact design and small footprint (around 3 Kg)
2) Dual plunger design for low pulse and continuous flow
3) Inert wetting material: PEEK, stainless steel, Sapphire, Rubby, PTFE, PCTFE
4) Controllable by LC-04SP software and easy integration with other HPLC systems
5) Low cost upgrade to a quaternary pump
6) Excellent flow accuracy (C.V. ≤ 0.5%)

2. Ordering Information

Part Number	Description	Price (US$)
LP-01P	HPLC pump Flow rate, 0.01-10.00 mL/min; pressure limit, 200 Bar; pressure sensor; PEEK material for bio compatability.	3,640
LP-01S	HPLC pump Flow rate, 0.01-10.00 mL/min; pressure limit, 250 Bar; pressure sensor; stainless steel for higher pressure limit.	4,090
LP-02P	HPLC pump Flow rate, 0.01-10.00 mL/min; pressure limit, 200 Bar; PEEK material for bio compatability.	3,090
LP-02S	HPLC pump Flow rate, 0.01-10.00 mL/min; pressure limit, 250 Bar; stainless steel for higher pressure limit.	3,540
LP-03	Gradient valve Includes control software for the gradient valve and the pump. Upgrade the above pumps to quaternary pump.	1,700

Online Degassers

An on-line degasser helps to reduce detection noise and improve the retention time reproducibility. When a low pressure gradient pump is used, an on-line degasser is required for a smooth operation. PromoChrom offers 6 types of degassers to meet the needs from analytical scale to preparative scale HPLC.

The degassers use a smart micro-controller to control the vacuum system and to ensure durable and trouble free operation. The LCD shows the real-time vacuum level. It gives a clear indication of the working status of the degasser.

1. Feature of online degassers

1) Real-time display of vacuum level to ensure proper operation
2) Separate degassing chamber for each channel to avoid cross contamination
3) Output signal for error monitoring
4) Inert wetting material: PTFE, ETFE, PPS, Chemraz
5) Small foot print for easy accommodation

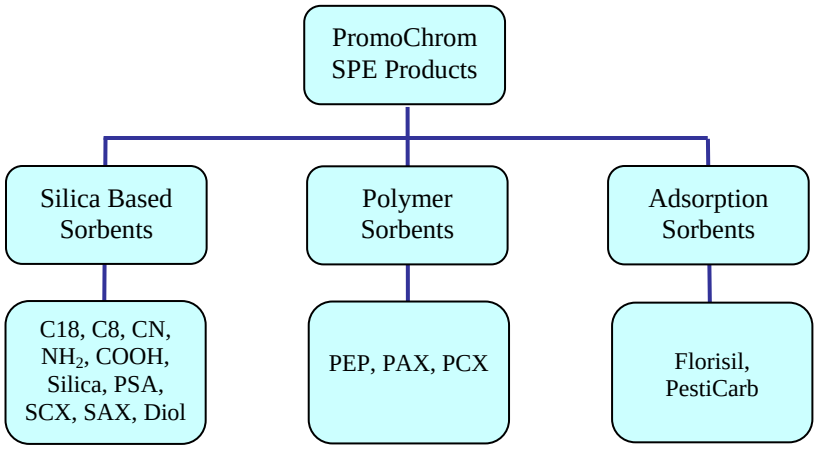
2. Ordering Information

Part Number	Description	Price (US$)
DG-052	Degasser for analytical HPLC Two channels; maximum flow rate, 5 mL/min.	1,800
DG-054	Degasser for analytical HPLC Four channels; maximum flow rate 5 mL/min.	2,200
DG-102	Degasser for semi-preparative HPLC Two channels; maximum flow rate, 10 mL/min.	1,900
DG-104	Degasser for semi-preparative HPLC Four channels; maximum flow rate 10 mL/min.	2,300
DG-501	Degasser for preparative HPLC One channel; maximum flow rate, 50 mL/min.	3,590
DG-502	Degasser for preparative HPLC Two channels; maximum flow rate 50 mL/min.	3,860

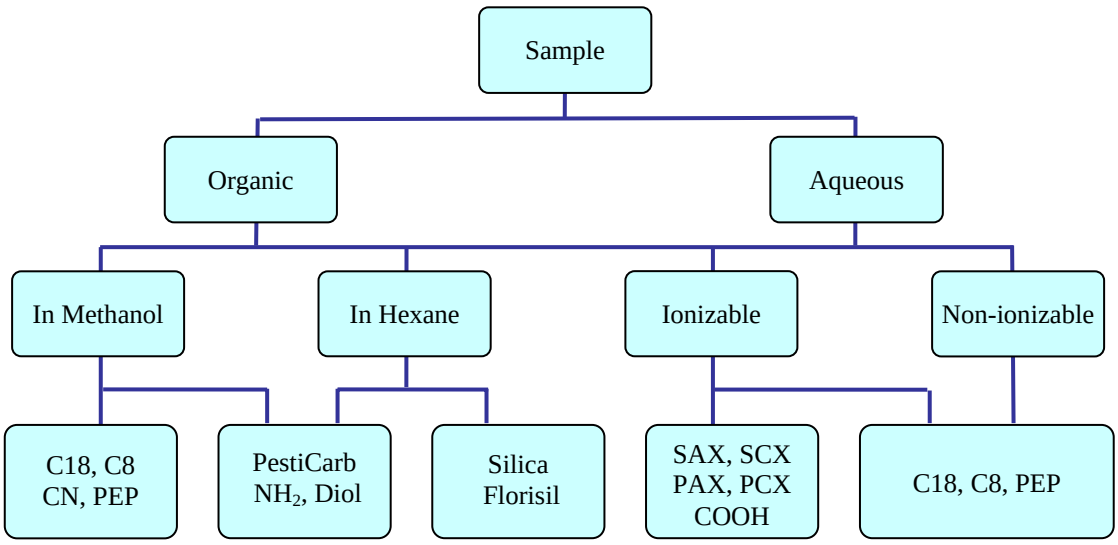
PromoChrom Solid Phase Extraction Cartridges

Solid phase extraction (SPE) is the most powerful technique currently available for rapid, selective sample preparation. The versatility of SPE allows it to be used for a number of purposes, such as purification, fractionation, trace enrichment, solvent exchange, desalting, and derivatization.

PromoChrom Technologies provides three major types of SPE sorbents.



1. Selection Guide – PromoChrom SPE Cartridges



2. Order Information – PromSil SPE Cartridges

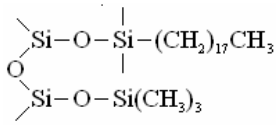
PromSil Silica Based Sorbents – C18, C8, CN, PSA, SAX, SCX, COOH, & PRS

Made of high quality and pure silica particles
Sorbent surface is specially modified to ensure high sample recovery and good reproducibility

Average particle diameter: 45 µm
Average Pore Size: 60 Å
Pore Volume: 0.8 cm^2/g
Specific Surface Area: 480 m^2/g

C18 (Endcapped) SPE Cartridge Order Information:

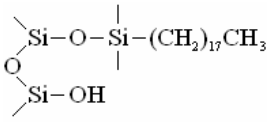
Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	18-010-1-C	108
200 mg, 3 mL	50	18-020-3-C	75
500 mg, 3 mL	50	18-050-3-C	88
500 mg, 6 mL	30	18-050-6-C	58
1000 mg, 6 mL	30	18-100-6-C	85



Structure of C18 silane and trimethyl silyl endcapping group, covalently bonded to the surface of a silica particle.

ODS C18-N (Non-endcapped) SPE Cartridge Order Information:

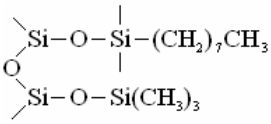
Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	18-010-1-N	108
200 mg, 3 mL	50	18-020-3-N	75
500 mg, 3 mL	50	18-050-3-N	88
500 mg, 6 mL	30	18-050-6-N	58
1000 mg, 6 mL	30	18-100-6-N	85



Structure of C18 octadecylsilane (ODS), covalently bonded to the surface of a silica particle.

C8 SPE Cartridge Order Information:

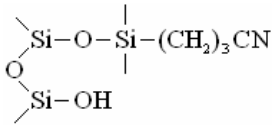
Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	08-010-1	108
200 mg, 3 mL	50	08-020-3	75
500 mg, 3 mL	50	08-050-3	88
500 mg, 6 mL	30	08-050-6	58
1000 mg, 6 mL	30	08-100-6	85



Structure of C8 octyl silane and trimethyl silyl endcapping group, covalently bonded to the surface of a silica particle.

CN Cyanopropyl SPE Cartridge Order Information:

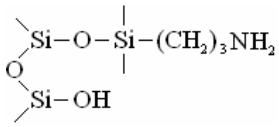
Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	CN-010-1	108
200 mg, 3 mL	50	CN-020-3	88
500 mg, 3 mL	50	CN-050-3	108
500 mg, 6 mL	30	CN-050-6	78
1000 mg, 6 mL	30	CN-100-6	118



Structure of cyano silane, covalently bonded to the surface of a silica particle.

NH_2 Aminopropyl SPE Cartridge Order Information:

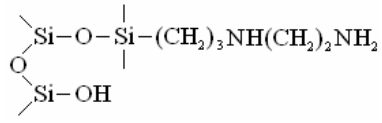
Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	NH-010-1	108
200 mg, 3 mL	50	NH-020-3	75
500 mg, 3 mL	50	NH-050-3	88
500 mg, 6 mL	30	NH-050-6	58
1000 mg, 6 mL	30	NH-100-6	85



Structure of amino (NH_2) silane, covalently bonded to the surface of a silica particle.

PSA (N-aminoethyl) Aminopropyl SPE Cartridge Order Information:

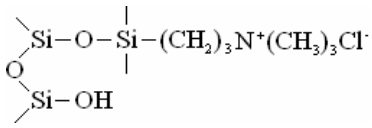
Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	PA-010-1	108
200 mg, 3 mL	50	PA-020-3	75
500 mg, 3 mL	50	PA-050-3	88
500 mg, 6 mL	30	PA-050-6	58
1000 mg, 6 mL	30	PA-100-6	85



Structure of PSA silane, covalently bonded to the surface of a silica particle.

SAX (Strong Anion Exchanger) SPE Cartridge Order Information:

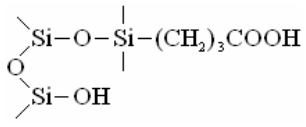
Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	SA-010-1	108
200 mg, 3 mL	50	SA-020-3	88
500 mg, 3 mL	50	SA-050-3	108
500 mg, 6 mL	30	SA-050-6	78
1000 mg, 6 mL	30	SA-100-6	118



Structure of SAX silane, covalently bonded to the surface of a silica particle.

COOH (Weak Cation Exchanger) SPE Cartridge Order Information:

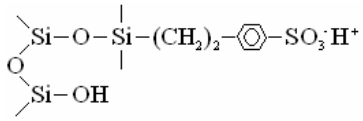
Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	CH-010-1	108
200 mg, 3 mL	50	CH-020-3	88
500 mg, 3 mL	50	CH-050-3	108
500 mg, 6 mL	30	CH-050-6	78
1000 mg, 6 mL	30	CH-100-6	118



Structure of propyl carboxylic acid (COOH) silane, covalently bonded to the surface of a silica particle.

SCX (Strong Cation Exchanger) SPE Cartridge Order Information:

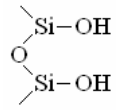
Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	SC-010-1	108
200 mg, 3 mL	50	SC-020-3	88
500 mg, 3 mL	50	SC-050-3	108
500 mg, 6 mL	30	SC-050-6	78
1000 mg, 6 mL	30	SC-100-6	118



Structure of SCX silane, covalently bonded to the surface of a silica particle.

Silica SPE Cartridge Order Information:

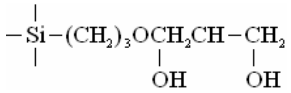
Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	SI-010-1	90
200 mg, 3 mL	50	SI-020-3	68
500 mg, 3 mL	50	SI-050-3	78
500 mg, 6 mL	30	SI-050-6	54
1000 mg, 6 mL	30	SI-100-6	70



Structure of silanol groups on the surface of a silica particle.

Diol SPE Cartridge Order Information:

Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	DI-010-1	108
200 mg, 3 mL	50	DI-020-3	88
500 mg, 3 mL	50	DI-050-3	108
500 mg, 6 mL	30	DI-050-6	78
1000 mg, 6 mL	30	DI-100-6	118



Structure of diol silane, covalently bonded to the surface of a silica particle.

PromSil Polymer Sorbents – PEP, PAX & PCX

PEP SPE Cartridge Order Information:

Description	Tubes/Box	Part Number	Price (US$)
30 mg, 1 mL	100	PE-003-1	138
60 mg, 3 mL	50	PE-006-3	98
100 mg, 3 mL	50	PE-010-3	118
200 mg, 6 mL	30	PE-020-6	108
500 mg, 6 mL	30	PE-050-6	128

Polystyrene/divinylbenzene with vinyl prolidone
Greater capacity than silica based sorbents
Extract both polar and non polar compounds
pH range: 1 - 14
Average particle diameter: 35 µm
Average pore size: 80 Å
Specific surface area: 600 m^2/g

Alternative to Oasis HLB

PAX SPE Cartridge Order Information:

Description	Tubes/Box	Part Number	Price (US$)
30 mg, 1 mL	100	AX-003-1	138
60 mg, 3 mL	50	AX-006-3	88
100 mg, 3 mL	50	AX-010-3	118
200 mg, 6 mL	30	AX-020-6	108
500 mg, 6 mL	30	AX-050-6	128

Polystyrene/divinylbenzene with strong anion exchange function
Mixed-mode sorbents (reverse phase and ion exchange)
pH range: 0 - 14
Average particle diameter: 40 µm
Average pore size: 70 Å
Specific surface area: 600 m^2/g

PCX SPE Cartridge Order Information:

Description	Tubes/Box	Part Number	Price (US$)
30 mg, 1 mL	100	CX-003-1	138
60 mg, 3 mL	50	CX-006-3	88
100 mg, 3 mL	50	CX-010-3	118
200 mg, 6 mL	30	CX-020-6	108
500 mg, 6 mL	30	CX-050-6	128

Polystyrene/divinylbenzene with strong cation exchange function
Mixed-mode sorbents (reverse phase and ion exchange)
pH range: 0 - 14
Average particle diameter: 40 µm
Average pore size: 70 Å
Specific surface area: 600 m^2/g

PromSil Adsorption Sorbents – PestiCarb and Florisil

PestiCarb SPE Cartridge Order Information:

Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	PC-010-1	299
200 mg, 3 mL	50	PC-020-3	168
500 mg, 3 mL	50	PC-050-3	168
500 mg, 6 mL	30	PC-050-6	158
1000 mg, 6 mL	30	PC-100-6	178

Graphitized Carbon
Average particle size: 120~400 mesh
Specially for sample cleanup in pesticide residue analysis

Similar to Supelco Envicarb

Florisil (Magnesia Silica) SPE Cartridge Order Information:

Description	Tubes/Box	Part Number	Price (US$)
100 mg, 1 mL	100	FS-010-1	90
200 mg, 3 mL	50	FS-020-3	68
500 mg, 3 mL	50	FS-050-3	78
500 mg, 6 mL	30	FS-050-6	54
1000 mg, 6 mL	30	FS-100-6	70

Synthetic Magnesia-Silica Adsorbent
Average particle diameter: 45-60 µm
Average pore size: 80 Å
Specific surface area: 290 m^2/g
Specially for sample cleanup in pesticide residue analysis

Terms and Conditions

Price

Prices in this catalog are for reference only and may change without notice. The prices do not include tax and costs on shipping and handling. Please ask PromoChrom or an authorized distributor for a quotation before placing your order.

Design Changes

Due to continuing improvements in design, some items may differ slightly from the descriptions and photographs. Specifications are subject to change without notice.

Warranties

The warranty period for instruments is one year. If notice of defects is received within the warranty period, PromoChrom shall, at its option, either repair or replace the defective products. If PromoChrom is unable to repair or replace the defective products within a reasonable time, buyers shall receive refund of the purchase price upon return of the products. The warranty for defects is limited to the purchase price of the product. In no event shall PromoChrom Technologies be liable for incidental or consequential damages in connection with the furnishing, performance, or use of the products.

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