Analytical & Semi-Prep Hybrid SFC Systems

SFC-4000 Series SFC

Performance
Innovation
Reliability

Our SFC systems have been designed to offer a flexible and customizable system to meet any requirement. The flexible system configuration is easily customized to offer a basic single column-single detector system to a multiple column-multiple detector system and anything in between. The fraction collection options range from simple time based 6 fraction collection to threshold based open-bed fraction collection. Software design features have been implemented to provide simple sample acquisition, automated data analysis, easy manual and automated fraction collection and a method scouting add-on for quick and easy solvent and column screening.

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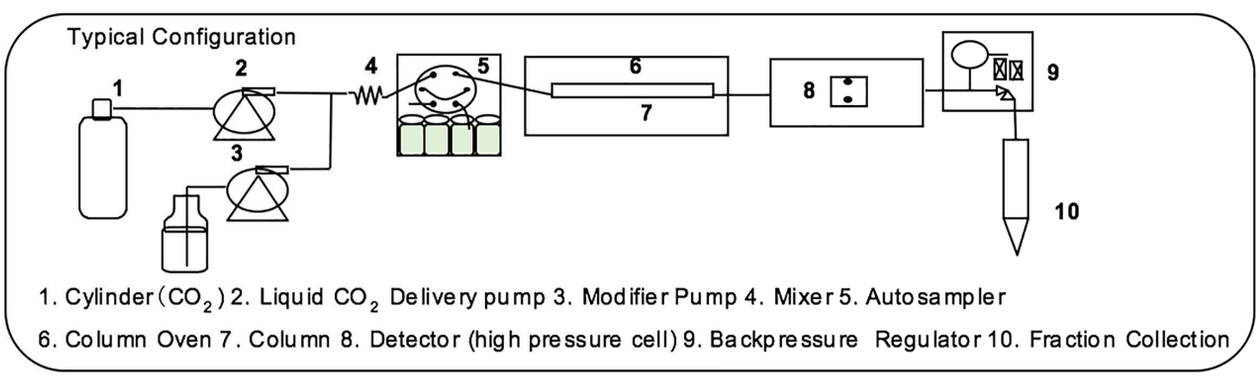
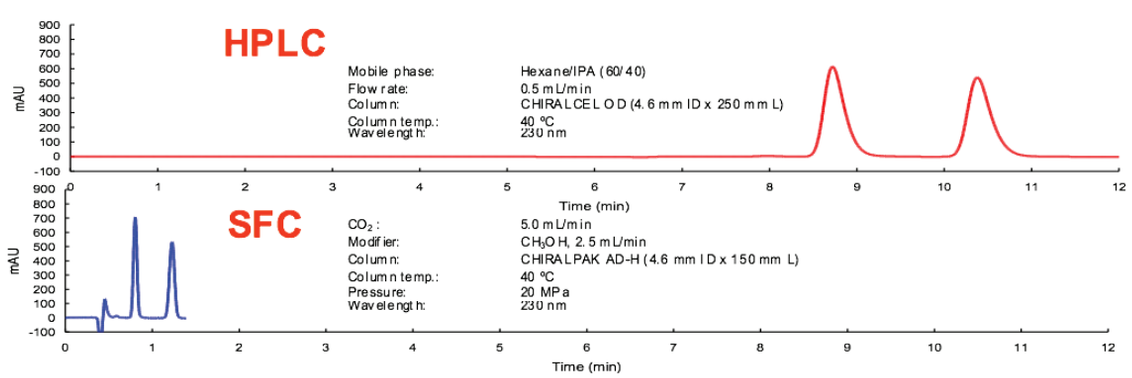
SFC Advantage

Supercritical Fluid Chromatography employs a supercritical fluid, most commonly CO_2, as the A mobile phase solvent for a chromatographic separation. The intrinsic low viscosity and high diffusivity of supercritical CO_2 has rendered SFC a faster separation and higher efficiency technique when compared to traditional LC. This provides faster flow rates and thus faster analysis times without the requirement for a higher pressure system like UHPLC. An alcohol solvent joins to the CO_2 to change the solvent strength (just like LC). This system, consisting of an autosampler, a column oven, and a detector, is very similar to HPLC. The back pressure regulator provides the back pressure requirement to keep the CO_2 supercritical, and is an integral part of the performance.



Advantages

1. Faster analysis times
2. Higher selectivity with longer and smaller particle columns
3. Reduction in solvent consumption
4. Friendly solvents
   a. CO_2 replaces hexane or heptane
   b. Alcohols typically used as co-solvents
5. Longer column lifetimes
6. Complementary to HPLC methods
7. Easy removal of mobile for preparative collection
8. Reduction in waste disposal



Analytical SFC

- The analytical CO_2 pump offers built-in peltier cooling to maintain a stable CO_2 flow yielding excellent retention time reproducibility. Automatic, built-in shut-off valves close the CO_2 inlet and outlet and isolate the pumps for quick and simple priming when not pumping.
- The autosampler holds up to 180 – 2 mL samples and provides full loop or variable loop injections up to 100 µLs. A sample pre-load feature eliminates the sample loading time between injections further increasing the throughput of the system.
- A variety of column ovens are available for single or multiple columns along with built in column selection valves to ensure equivalent temperature for the columns and valves to provide the highest performance separation and reproducibility.
- The patented design of the back pressure regulator provides unmatched pressure regulation for an extremely quiet baseline and excellent retention time reproducibility.

System	Column ID	CO_2 Flow Rate	Injection Capacity
Analytical	3 mm, 4.6 mm	0.2 - 10 mL	Analytical
Hybrid	4.6 mm, 10 mm	0.5 - 20 mL	Analytical to 20 mg
Semi-Preparative	4.6 mm, 10 mm, 20 mm	3.0 - 50 mL	10 mg to 100 mg
Preparative	10 mm, 20 mm, 30 mm	5.0 - 150 mL	10 mg to grams

Detectors

UV-4070/4075
UV-Visible Detector
Wavelength range: 190-600 nm (or 900 nm), with high pressure analytical and preparative flow cells

MD-4010/4015/4017
UV-Visible PDA Detectors
Wavelength range: 190-400 nm (or 600 nm, or 900 nm), with high pressure analytical and preparative flow cells

CD-4095
Circular Dichroism Detector
Wavelength range: 220-460 nm with high pressure analytical and preparative flow cells

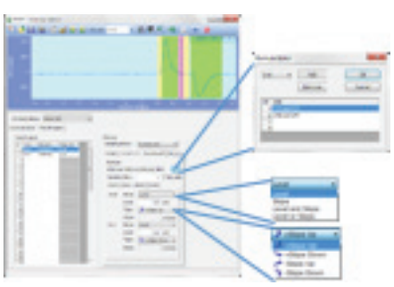
CMS
Mass Spectrometer
m/z range: up to 1200 (or 2000) single quadrupole mass spectrometer

Hybrid SFC

System	Column ID	CO_2 Flow Rate	Injection Capacity
Analytical	3mm, 4.6mm	0.2 - 10mL	Analytical
Hybrid	4.6 mm, 10mm	0.5 - 20mL	Analytical to 20mg
Semi-Preparative	4.6mm, 10mm, 20mm	3.0 - 50mL	10mg to 100mg
Preparative	10mm, 20mm, 30mm	5.0 - 150mL	10mg to grams

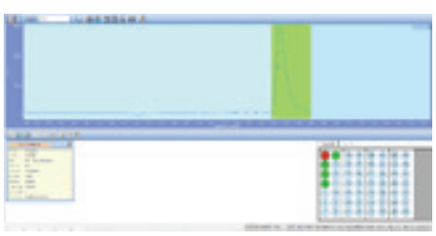
- The hybrid CO_2 pump offers a flow range from 0.5 to 20 mL/min covering both analytical 4.6 mm ID columns and semi-prep 10 mm ID columns. Automatic, built-in shut-off valves close the CO_2 inlet and outlet and isolate the pumps for quick and simple priming when not pumping.
- The autosampler holds up to 180 – 2 mL samples and provides full loop or variable loop injections up to 100 µLs. With the addition of the large volume injection add-on, injections up to 1 mL can be used from 4 mL sample vials. A sample pre-load feature eliminates loading time between injections and the stacked injection capability increases the throughput of the system for both analytical and semi-prep.
- A variety of column ovens are available for single or multiple columns along with built in column selection valves to ensure equivalent temperature for the columns and valves to provide the highest performance separation and reproducibility.
- The same detector options are available for the hybrid as the analytical SFC including UV, PDA, CD and MS. Multiple detectors may be selected and fraction collection can be triggered from any combination of detector signals.
- The patented design of the back pressure regulator provides unmatched pressure regulation for an extremely quiet baseline and excellent retention time reproducibility.

Fraction Collection



Fraction Simulation

For simple setup of the fractionation conditions, a graphical simulation of previous chromatograms is used to define and review collection conditions.



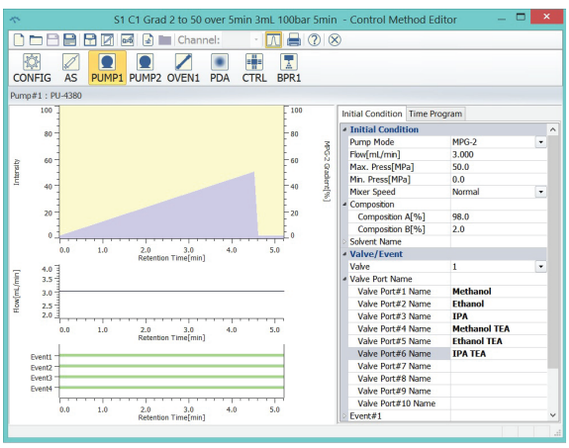
Fraction Display

During both manual and automated fraction collection, the fraction vials in the sample tray are shown to fraction location.

Live Collection

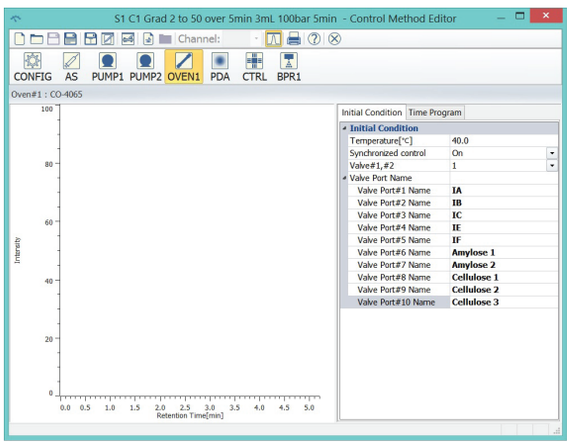
The patent pending micro-cyclone separators provide simple gas-liquid separation in the fraction vial yielding recoveries of 95% or greater.

Method Development



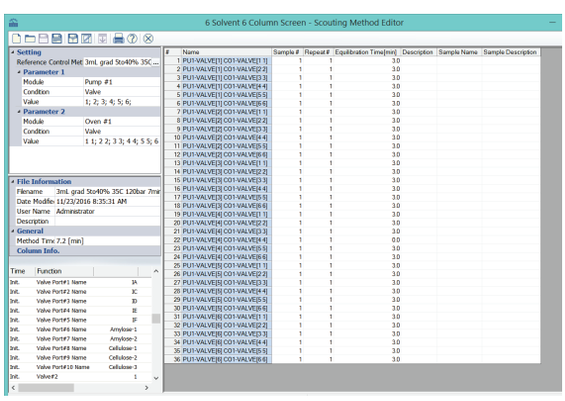
Solvent Selection

1, 6 or 10 solvent selection is available for the co-solvent pump. Solvents can easily be named and appear with data and in a report.



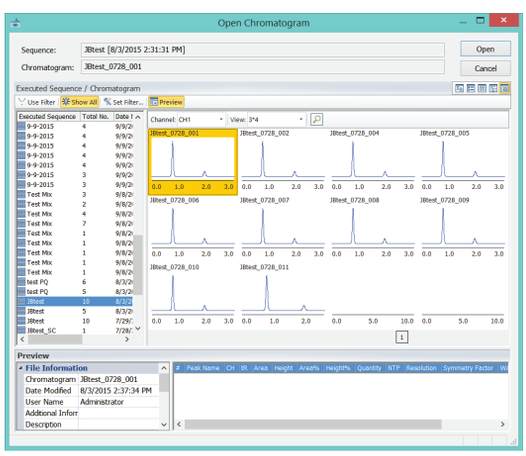
Column Selection

1, 6 or 10 column selection is available with valves built into the column ovens. Columns can easily be named and appear with data and in a report.



Method Scouting

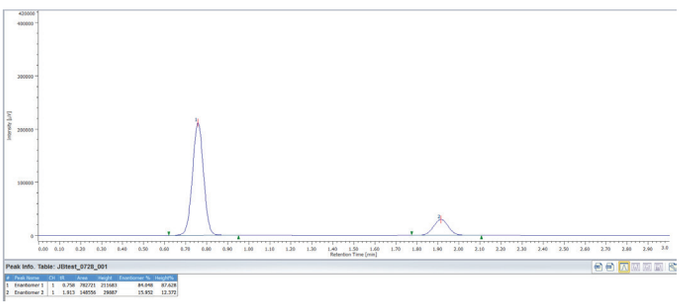
The method scouting software allows for building a sequence screening through up to 10 solvents and 10 columns in a matter of seconds.

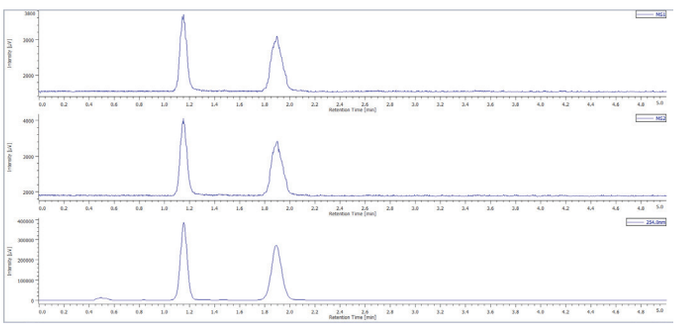


Column Selection

The chromatogram previewer allows up to 48 chromatograms to be viewed per page together to quickly and easily determine the best solvent and column combination.

ChromNAV Software





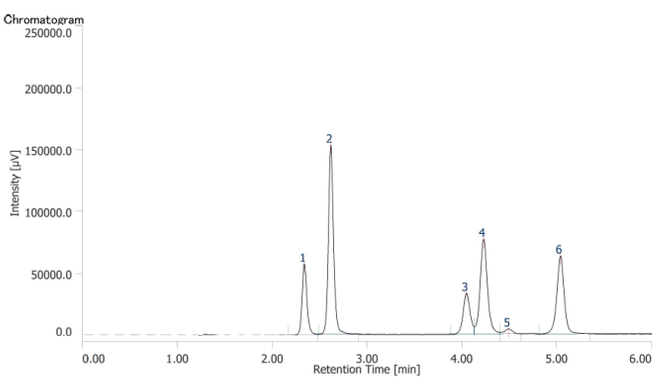
Instrument Control

Control up to four systems simultaneously. The LC-Net II/ADC is the hardware interface between your PC and the system components. Four different detector signals can be plotted in ChromNAV in addition to those from a PDA detector. Extracted wavelengths can be chosen before, during or after the acquisition. The MS data can also be panned afterward to identify unknown peaks.

Data Acquisition

Pre-built methods and sequences are utilized for quick and easy sample analysis. The sequence allows inclusion of predetermined integration, peak identification, calibration and fully customizable reports for complete automation from sample analysis to report printing. ChromNAV allows the automatic export of raw data and peak calculation results to Microsoft Excel as well as other formats.

SFC Achiral Report



Chromatogram Information

Injection Date	9/14/2015 5:20:13 PM
Volume	1.00 [μL]
Sample #	1
Column Info	

Peak Information

#	tR [min]	Area [μV·sec]	Height [μV]	Area%
1	2.338	200916	56834	11.654
2	2.620	573958	152722	33.293
3	4.047	169562	33020	9.836
4	4.229	413022	76489	23.958
5	4.492	22351	3943	1.296
6	5.037	344166	62994	19.964

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ISO 9001 Certified

ISO 14001 Certified

CE

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