

Prep SFC System

SFC-4000 Series



JASCO

Performance
Innovation
Reliability

The Preparative SFC systems have been designed to meet the needs of various scale purifications for 10mm, 20mm and 30mm ID columns. 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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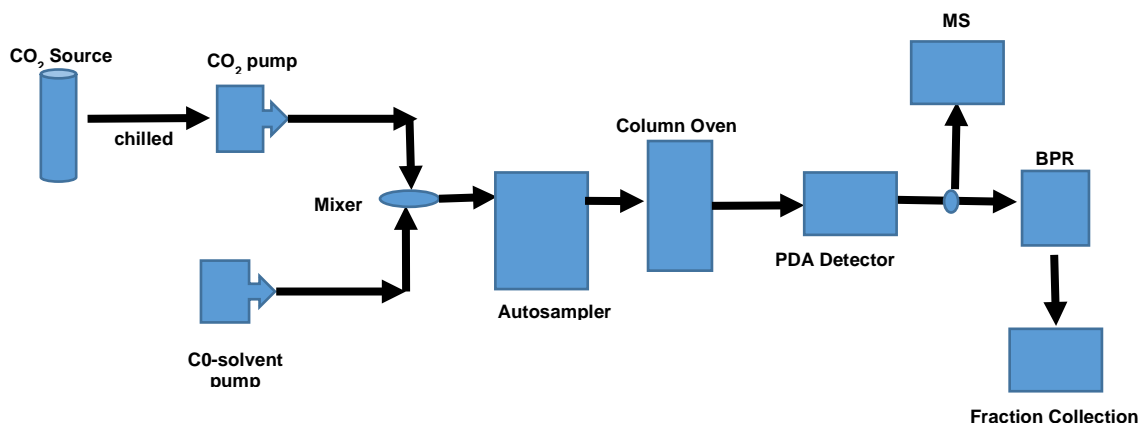
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Prep SFC Advantage

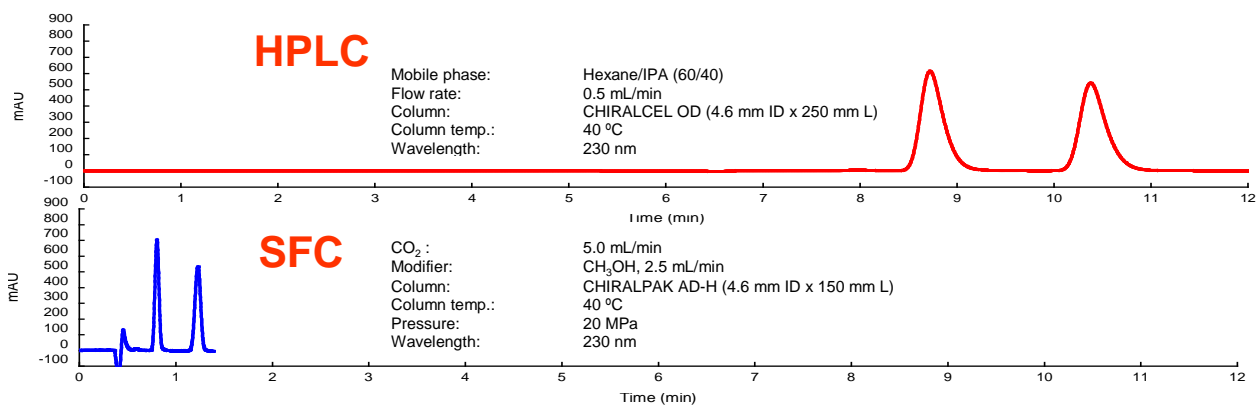
Preparative Supercritical Fluid Chromatography employs supercritical CO₂ with a co-solvent, typically an alcohol, to provide a chiral or achiral purification. The intrinsic low viscosity and high diffusivity of supercritical CO₂ has rendered preparative SFC a faster separation and higher efficiency purification when compared to traditional Prep LC. Faster flow rates lead to

shorter purification times while still providing excellent resolution. Preparative SFC columns provide a much higher sample load than Prep LC columns meaning fewer injections. After fraction collection the CO₂ expands into a gas leading to smaller fraction volumes with easy sample recovery from the alcoholic co-solvents.



Advantages

- 1) Faster purification times
- 2) Higher loadability on columns
- 3) Easy removal of mobile phase for fraction recovery
- 4) Reduction in solvent consumption
- 5) Friendly solvents
 - a. CO₂ replaces hexane or heptane
 - b. Alcohols typically used as co-solvents
- 6) Longer column lifetimes
- 7) Complementary to HPLC methods
- 8) Reduction in waste disposal

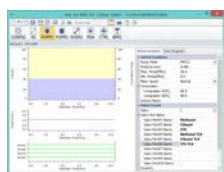


Hybrid SFC



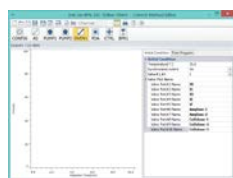
System	Column ID	CO ₂ Flow Rate	Injection Capacity
Analytical	3mm, 4.6mm	0.2 - 10mL	Analytical
Hybrid	4.6 mm, 10mm	0.5 - 20mL	Analytical to 100mg
Semi-Preparative	4.6mm, 10mm, 20mm	3.0 - 50mL	100mg to 100grams
Preparative	10mm, 20mm, 30mm	5.0 – 150mL	Up to 500grams

The hybrid SFC system is designed for users looking to combine both analytical method development and small scale purification into one system. This system offers flow rates from 0.5 to 20mL/min for 4.6mm and 10mm columns. After the best solvent-column combination is determined, separation optimization is performed prior to scale up to the semi-prep column. The system offers open-bed fraction collection based on time, threshold or slope from up to 4 different detector signals including UV, CD and/or MS. Our unique micro-cyclone separators provide simple open-bed collection with the gas-liquid separation occur in the fraction vial for maximum recovery of greater than 90%. The flexible fraction layout allows for collection in fraction vials (40mL or 100) or larger duran bottles (100mL, 250mL or 500mL) depending on the expected fraction volume.



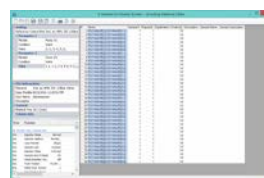
Solvent Selection

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.



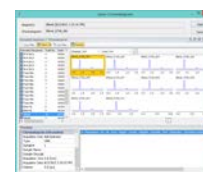
Column Selection

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.



Chromatogram 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.

Semi-Preparative 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 100mg
Semi-Preparative	4.6mm, 10mm, 20mm	3.0 - 50mL	100mg to 100grams
Preparative	10mm, 20mm, 30mm	5.0 – 150mL	Up to 500grams

The semi-prep SFC is designed for users requiring a higher purification capability, but still needing analytical scale for method development. The system is optimized for 4.6mm, 10mm and 20mm ID columns for a wide range of applicability. The system has optional column selection valves for holding multiple columns banks up to 20 columns eliminating the need to remove and replace columns when scaling up from analytical to semi-prep. The open-bed fraction collector is triggered on time, threshold or slope based on up to 4 different detectors signals including UV, CD and/or MS. Our new macro cyclone separators provide simple gas-liquid separation in the fraction bottle for unmatched fraction recoveries of greater than 90%.

#	Type	Sample #	Volume	Chromatogram Name	Acq. Time	Control Method	MS Method	Collection Vial	Collection Method	MS #1	MS #2	MS #3	MS #4
1	UPLC	1	300.0	Sample 1	10.0	20% Iso 10min	MS FIC Method	Initial Vial	Threshold Collection	254.000	308.000	495.000	823.000
2	UPLC	1	300.0	Sample 2	10.0	20% Iso 10min	MS FIC Method	Next Vial	Threshold Collection	304.000			
3	UPLC	1	300.0	Sample 3	10.0	20% Iso 10min	MS FIC Method	Next Vial	Threshold Collection	354.000	524.000		
4	UPLC	1	300.0	Sample 4	10.0	20% Iso 10min	MS FIC Method	Next Vial	Threshold Collection	215.000			
5	UPLC	1	300.0	Sample 5	10.0	20% Iso 10min	MS FIC Method	Next Vial	Threshold Collection	204.000	465.000	499.000	

Fraction Collection Sequence

The fraction collection sequence with the open-bed fraction collector allows for multiple samples with different masses to quickly and easily be created for triggered based on a specific mass or masses.

Preparative 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 100mg
Semi-Preparative	4.6mm, 10mm, 20mm	3.0 - 50mL	100mg to 100grams
Preparative	10mm, 20mm, 30mm	5.0 – 150mL	Up to 500grams

The preparative SFC system is the ultimate system for purification throughput for 10mm, 20mm and 30mm columns. Whether the system is needed for multiple sample library purification or individual sample large quantity purification, there is an injection module to match with a preparative autosampler or syringe based large volume injector. Fraction collection can be triggered based on time, threshold or slope from up to 4 different detector signals including UV, CD and/or MS. The fraction layout is flexible offering open-bed fraction collection for a larger number of fractions for multiple samples or valve based for repeat injections producing large fraction volumes.



Open-Bed Prep

The open-bed fraction collector offers up to 40 - 200mL fraction vials.

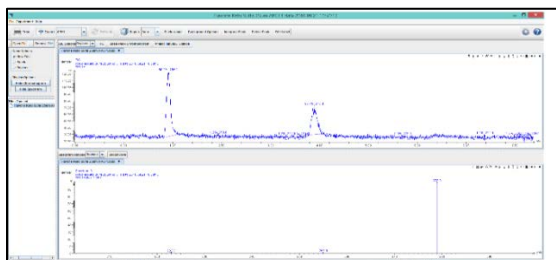
SFC-MS



- The integrated SFC-MS combines all of the advantages of SFC with the selectivity and sensitivity of a mass spectrometer for any of our preparative SFC systems.
- The simple, cost effective single quadrupole Mass Spectrometer is the perfect complement to SFC. As CO₂ leaves the BPR it depressurizes at a 500:1 rate and assists with nebulization needed for ion sources.
- Multiple source options are available including ESI, APCI and ASAP and also includes positive/negative switching for the ultimate detection flexibility up to 2000 AMU.
- The complete system control is contained in one software platform for simple sample acquisition and analysis. MS Auto-calibration and auto-tuning features are built into the software for easy optimization.
- Fraction triggering is based on time, MS threshold, MS slope or any combination. For MS threshold, the mass or masses to trigger collection on is simply typed in the sequence.

Control

Combined software platform offers complete and easy system control and quick access to all MS data.



Data

MS data analysis such as extracting ions or exploring the MS spectra requires just a few clicks.



AutoTuning and performance checks are built in to ensure your MS is performing at its peak.



Fraction Collection

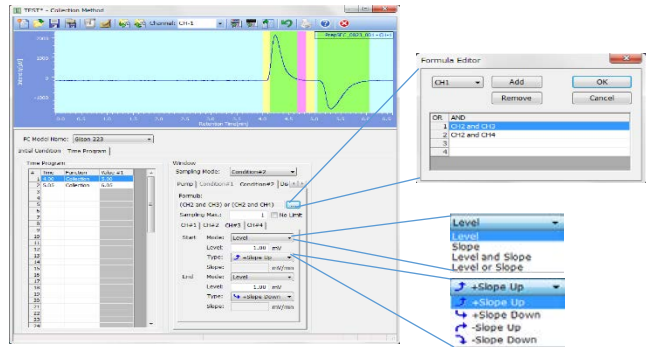
Make-up Pump

A fraction make-up pump adds extra solvent just prior to the back pressure regulator to increase fraction recovery and solubility, especially as low co-solvent percentages.



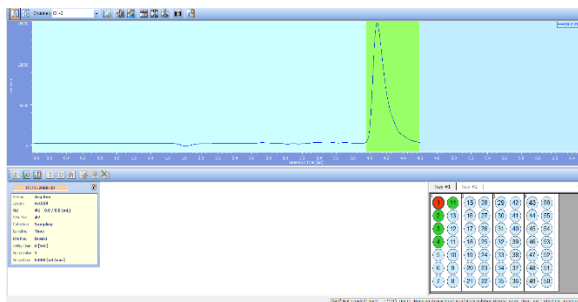
Fraction Simulation

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



Fraction Collection

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



High Recovery

The patent pending micro-cyclone separators provide simple gas-liquid separation in the fraction vial yielding 90% or higher recoveries.

