Agilent InfinityLab SFC Solutions

EXTEND YOUR APPLICATION REACH WITH MAXIMUM EFFICIENCY
Agilent’s new supercritical CO₂-based technologies deliver robust, reliable, and reproducible separation results for diverse sample types with the widest selectivity from polar to nonpolar. What’s more, Agilent InfinityLab SFC Solutions maximize efficiency, use less solvents, and lower costs while being fully compatible with the full range of Agilent mass spectrometers.

**ANALYTICAL EFFICIENCY**
Unleash the power of SFC. Separate at high flow rates up to 600 bar. Achieve analysis speeds up to 10-times faster than HPLC.

**INSTRUMENT EFFICIENCY**
Exploit the full orthogonality of supercritical fluid chromatography. Compare SFC and UHPLC results on one system.

**LABORATORY EFFICIENCY**
Reduce costs of solvent purchase and waste disposal by a factor of 5. Eliminate toxic solvents. Make your lab leaner and greener.
COMPLETE SOLUTIONS

Agilent InfinityLab SFC Solutions are truly complete end-to-end solutions, combining superior instruments and columns, smart supplies, intuitive software, and dedicated services.

InfinityLab Instruments, Columns and Supplies
Designed to work together in perfect harmony, Agilent InfinityLab SFC instrumentation and single quadrupole mass selective detectors combine with Agilent columns and InfinityLab supplies to maximize the efficiency of your SFC workflows.

Agilent CrossLab
Services and Support
Learn how to gain the maximum benefit from your InfinityLab SFC Solutions through our comprehensive suite of services and learning solutions.

Agilent OpenLAB
Software and Informatics
Stay in full control of all your SFC applications through OpenLAB CDS software, and optimize development of your SFC methods with Method Scouting Wizard.
InfinityLab SFC Solutions are fully-fledged members of the InfinityLab family. While some modules have been reengineered to cater for the demands of liquefied CO₂ as mobile phase, many modules remain unchanged and are common to both SFC and UHPLC systems.

**Agilent 1260 Infinity II SFC/UHPLC Hybrid System**

Switch between SFC and UHPLC with a simple mouse click! With the easy-to-install addition of a 2-position/10-port valve and a 1260 Infinity II LC Pump, your system becomes a fully operational hybrid SFC/UHPLC solution. The option of running both SFC and UHPLC applications on the same system allows you to maximize the utilization of your analytical equipment. The core of the hybrid solution is the 1260 Infinity II SFC Multisampler. With feed injection for SFC sampling and classic flow-through injection for UHPLC sampling, the SFC Multisampler is flushed automatically when switching between techniques.

**EFFICIENT COLUMN HANDLING**

Hands-free selection of up to four columns. Independent heating zones for optimum separation and postcolumn conditioning.

**HYBRID, MULTIPURPOSE SAMPLING**

New, unique feed injection for SFC sampling. Classic flow-through injection for UHPLC sampling. Flexible choice of sample containers such as 2 or 6 mL vials, or microtiter plates. Highest capacity up to 432 samples in 2 mL vials.

**SFC feed injection**

- Extended injection volume range from 0.1 to 90 µL
- Full choice of sample transfer solvent and injection speed
- No delay volume
- Reduced sample solvent effects

**SUPERIOR SOLVENT DELIVERY**

Highest flow accuracy and precision up to 5 mL/min at 600 bar. Improved usability and extended lifetime through integrated degasser, solvent selection, valve and active seal wash.
PERFECTLY MATCHED SUPPLIES
Smaller footprint, easy-to-grip solvent bottles with Stay Safe caps make solvent handling more convenient – just two of the many InfinityLab LC supplies that help deliver reliable, robust performance.

EXTENDED APPLICATION REACH
Check out our broad range of detection options, see page 10.

CONVENIENT CO2 HANDLING
Programmable backpressure gradients for shorter analysis times. Full-flow transfer to MS or ELSD with new low-dispersion nozzle. Increased robustness and extended lifetime through major overhaul of booster pump.
InfinityLab Method Development Solutions comprise instruments, columns, software, and services that work together in perfect harmony, helping you to develop your chromatographic methods with maximum efficiency.

**Dedicated hardware for the highest degree of automation**

The flexibility of the InfinityLab SFC solutions helps you to solve your toughest development challenges. Simply install an external solvent-selection valve and gain immediate, automated access to 15 different solvents. Cluster two, three, or even four 1290 Infinity II Multicolumn Thermostats for automated screening of up to 32 columns.

Easy, automated access to columns and solvents gives you ultimate flexibility in method development.

**Columns and supplies for simple and quick method development**

ZORBAX and InfinityLab Poroshell columns are manufactured end-to-end by Agilent and monitored with multiple QC tests, so you can be assured of rugged, reproducible performance and long column lifetimes. From Quick Connect capillaries through Stay Safe caps, our wide range of parts, kits, and accessories are designed, manufactured, and tested under a quality system registered to ISO 9001.

Download our Quick Reference Guide for SFC Supplies from [www.agilent.com](http://www.agilent.com), search for 5991-8116EN.
Advanced tools for advanced applications

When combining your SFC solution with triple quadrupole or quadrupole time-of-flight mass spectrometers, Agilent MassHunter software is designed to make your MS analyses faster, easier, and more productive. MassHunter’s modular architecture lets you integrate new features to match your workflow requirements.

Dedicated software accelerates method development

Agilent OpenLAB CDS ChemStation Edition provides the versatility you need to develop your SFC methods. Agilent Method Scouting Wizard helps you to generate methods sequences for complex screening campaigns within minutes. Agilent MassHunter Walkup software allows users of different skill levels to perform their own SFC and SFC/MS analyses. Results show up in the submitter’s in-box automatically.

The right tools for the job

Whether you run a small lab with few instruments or a larger operation with a requirement for networked solutions, OpenLAB software products cover all demands. OpenLAB CDS 2 increases productivity in analytical QC labs and gives you peace of mind when regulatory agencies audit or inspect your operation. With support for SFC and single quadrupole mass selective detection, OpenLAB CDS 2 helps you to:
• Deliver results quickly and securely by performing calculations and producing reports in the protected environment of the software
• Identify nonconforming samples quickly with Peak Explorer visualization tool and MatchCompare add-on

Method Scouting Wizard is an easy-to-use but highly effective tool to develop SFC and UHPLC methods with less effort. Use this add-on for OpenLAB CDS ChemStation to reduce time spent on manual scanning of different parameters such as mobile phases and columns.

OpenLAB CDS 2 – One software for Agilent SFC, LC, LC/MS, GC, GC/MS and other vendors’ instruments provides the same user experience and enables viewing data across techniques and instruments with the same user interface.
Switch to SFC now and benefit from an immediate reduction in the costs of solvent purchase and waste disposal. What’s more, the virtual elimination of hazardous solvents makes your lab a cleaner place to work as well as protecting the environment.

Except for extremely polar separation techniques such as ion exchange chromatography, SFC largely covers the same application areas as normal-phase LC, reversed-phase LC, and hydrophilic interaction chromatography (HILIC). The applicability of SFC ranges from nonpolar hydrocarbons through high-polarity amines, hydroxy acids, and peptides.

Leaner and greener – but where can I use SFC?

As a fully orthogonal separation technology to liquid chromatography, SFC has the potential to replace LC in a huge number of applications that span a wide range of analyte polarities. An impressive number of publications on completely diverse applications report SFC as the superior choice to LC. The main area where SFC delivers better results covers applications currently using normal-phase LC such as the analysis of chiral molecules.
A supercritical fluid is any substance at a temperature and pressure above its critical point, where distinct liquid and gas phases do not exist. Close to the critical point, small changes in pressure or temperature result in large changes in density. These characteristics make it possible to adjust many physical properties so that a supercritical fluid can be used as a substitute for organic solvents in industrial and laboratory processes such as chromatography.

In supercritical fluid chromatography, carbon dioxide is the most commonly used solvent whereby cosolvents are added to modify the mobile phase polarity and thereby change the selectivity of the separation system.

**Benefits at a Glance**

**Reduce hazardous solvents**
Replacing normal-phase LC by SFC means a significant reduction in the need for hazardous solvents such as acetonitrile, dichloromethane, or heptane. Your lab becomes a greener place to work where your only concern is the GHS classification of typical SFC modifiers such as methanol, ethanol, or isopropanol.

**Reduce solvent costs**
InfinityLab SFC Solutions use food-grade carbon dioxide as the primary mobile phase. Food-grade CO₂ can be purchased at a fraction of the cost of the primary solvents used in other modes of liquid chromatography. Significant savings are also made in waste disposal with only small amounts of modifiers being used.

**Reduce waste production**
The proportion of organic modifier used in SFC gradients is generally significantly lower than in normal- or reversed-phase LC. As a result, SFC generates far less waste. The major solvent, carbon dioxide, simply evaporates and diffuses safely into the atmosphere.
InfinityLab SFC Solutions extend and broaden your application reach by providing an orthogonal separation mechanism that can be combined with a wide variety of different detection techniques. Choose a detector that matches your needs for selectivity and sensitivity, the number of analytes, and the complexity of your sample matrix.

**Evaporative light scattering detection**
1290 Infinity II ELSD
Quantitative and qualitative analysis of nonvolatile analytes that lack UV-visible chromophores such as sugars.

**Flame ionization detection***
1260 Infinity II SFC
Sensitive analysis of fuels by flame ionization, according to standard methods such as ASTM D5186.

*SIM Scientific Instruments Manufacturer GmbH

**UV-visible detection**
1260 Infinity II DAD
Determination of enantiomeric ratios or quantification of a small number of known analytes.

**Full-flow transfer for highest sensitivity**
To achieve highest sensitivity, transfer the complete SFC effluent containing your precious sample to the ELSD, MSD, or LC/MS. The new low-dispersion nozzle significantly reduces the adverse effects of passing through the backpressure regulator.
**Number of analytes**

**Mass selective detection**
*InfinityLab MSD*
Simplified peak tracking in method development or quantification of a few analytes in simple matrices.

**Triple quadrupole mass spectrometry**
*6470 Triple Quadrupole LC/MS*
Highly sensitive forensic screening, confirmation, and quantification of drugs of abuse, pesticides, or vitamins in challenging matrices.

**Quadrupole time-of-flight mass spectrometry**
*6545 Quadrupole Time-of-Flight LC/MS*
Full screening of suspect analytes or unknowns in complex matrices using data-mining tools, and personal compound databases and libraries (PCDL).

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**Flow splitting for highest resolution**
To achieve highest resolution, use a flow splitter in front of the backpressure regulator so that only a portion of the SFC eluent is transferred to the detector. This setup keeps the dispersion volume to a minimum and reduces band broadening.
InfinityLab SFC Solutions allow you to separate and quantify complex mixtures faster and more efficiently than ever before. Deploying SFC in your lab gives you a technique that is orthogonal to normal- or reversed-phase LC and enables you to reach beyond your current application spectrum.

Use SFC to separate your most challenging samples

Vitamin E tocopherols and tocotrienols have different biological activities and chemical properties so it is important to identify and quantify each vitamer separately. SFC enables complete resolution of all vitamers within a significantly shorter analysis time.

Download Application Note from www.agilent.com, search for 5991-1546EN.

Separation and UV detection of 14 antioxidants found in vegetable oils by UHPLC (left) and by SFC (right). The concentration of each antioxidant was 10 μg/mL.
Solve separation problems faster and more reliably with SFC

The E7 liquid crystal mixture can be separated and quantified within two minutes using SFC with UV detection. This is up to 40-times faster than analysis based on normal-phase LC. Further, SFC delivers improved peak shape for more reliable quantification.

Download Application Note from www.agilent.com, search for 5991-6436EN.

Benefit from unmatched injection precision with flexible injection volumes

The new feed-injection principle achieves unmatched precision and linearity with negligible carryover. It provides full flexibility in the selection of injection volume and eliminates the disadvantages associated with the widely used fixed-loop injection technique.

Download Technical Overview from www.agilent.com, search for 5991-7623EN.

Feed injection delivers unprecedented area linearity over a wide volume range from 0.1 to 90 μL.
The analysis speed and the flexibility to handle large and small injection volumes make InfinityLab SFC Solutions the perfect tool for method and compound screening. What’s more, our SFC systems combine seamlessly with high-end mass spectrometry.

**Develop and optimize new SFC methods for your chiral separations**

The InfinityLab SFC Method Development Solution with Agilent Method Scouting Wizard facilitates software-aided method scouting of four chiral columns to develop and optimize new methods.

Download Application Note from [www.agilent.com](http://www.agilent.com), search for 5991-7624EN.

For Research Use Only. Not for use in diagnostic procedures.

SFC is a fast approach to identify speed-optimized methods for separation of racemates such as propranolol. The final optimized method is shown right.
Determine drugs of abuse at trace levels using SFC with triple quadrupole MS

SFC is an ideal separation technique for fast, quantitative screening of different classes of drugs, ranging from simple amines to complex morphine-like structures such as those analyzed in forensic toxicology applications. Highest analytical sensitivity is achieved by combining SFC with triple quadrupole mass spectrometry.

Download Application Note from www.agilent.com, search for 5991-6747EN.

For Forensic Use.

Identify and quantify more than 200 pesticides in a single SFC/MS run

The combined performance of SFC and triple quadrupole MS makes it possible to identify and quantify over 200 pesticides in a single run. Using dynamic multiple reaction monitoring (DMRM) significantly improves the sensitivity of the analysis.

Download Application Note from www.agilent.com, search for 5991-6151EN.