Waters

THE SCIENCE OF WHAT'S POSSIBLE.™

METHOD STATION SFC AND RESOLUTION SFC MS SYSTEMS

The power of SFC analysis with UV and MS detection for definitive compound identification

A GREEN APPROACH TO ANALYTICAL APPLICATIONS

Supercritical Fluid Chromatography (SFC) utilizes liquid carbon dioxide in combination with one or more organic solvents as the mobile phase. SFC has broad applicability across a wide variety of industries, including pharmaceutical, nutraceutical, natural products, and petrochemical. This easy-to-use normal-phase technique operates at flow rates higher than traditional HPLC without significant increases in operating pressure allowing for:

- Decreased solvent consumption
- Lower cost per sample
- Faster run times and equilibration
- Chiral and achiral analysis in a single platform
- Orthogonal solution to reversed-phase HPLC
- Analytical to preparative method development
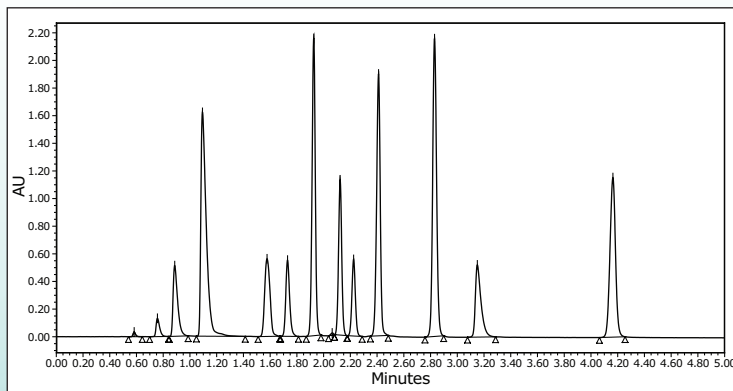
Efficient SFC separation – This complex mixture of acidic, basic, and neutral compounds was performed on a 4.6 X 100 mm HILIC column in under 5 min, with all of the compounds baseline resolved.

## ANALYTICAL SFC SYSTEMS FOR CHIRAL AND ACHIRAL COMPOUNDS

Method Station SFC System

The Method Station SFC System provides high throughput analytical analysis, without sacrificing performance, for a wide variety of applications including both chiral and achiral separations. The system incorporates automated control of pressure and temperature, unique compound screening capabilities, and standard six co-solvent and ten column selection capability. The system can be controlled through a variety of software platforms, including MassLynx,™ Empower,™ and ChromScope,™ depending on your requirements.
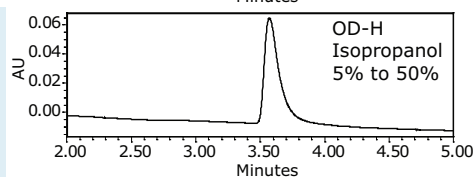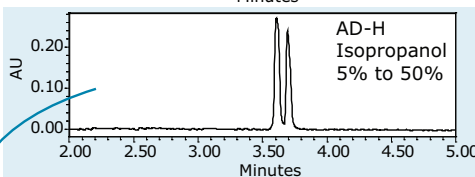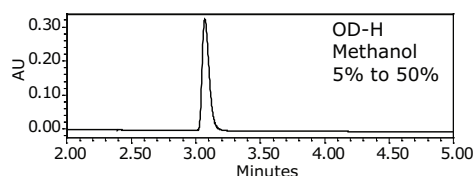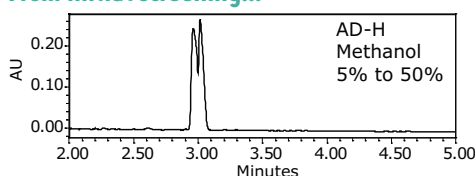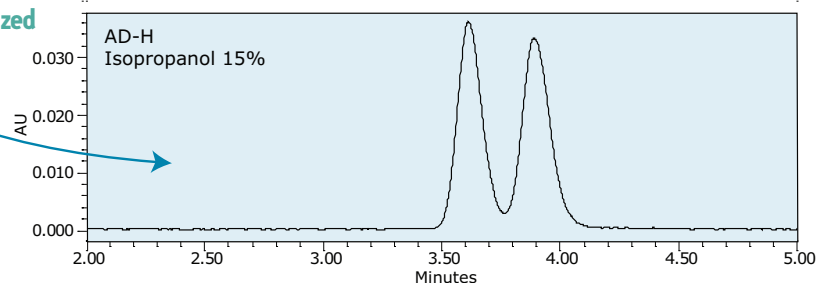
The solvent and column selection capability of the Method Station SFC System dramatically reduces the time required to develop an optimized chiral separation, perfoming faster solvent and stationary phase screening. In this example, once the screening indicated that the AD-H column/IPA combination achieved the best separation the method was then easily optimized.

SOFTWARE OPTIONS TO SUIT YOUR LAB'S NEEDS

All data acquisition, analysis, and instrument control for both SFC and MS is done from one software platform. This means less time learning software, and more time running samples.

Software platforms available for the Method Station SFC System:

- Empower
- MassLynx
- ChromScope

Software platforms available for the Resolution SFC MS System:

- Empower
- MassLynx with OpenAccess™ Application Manager
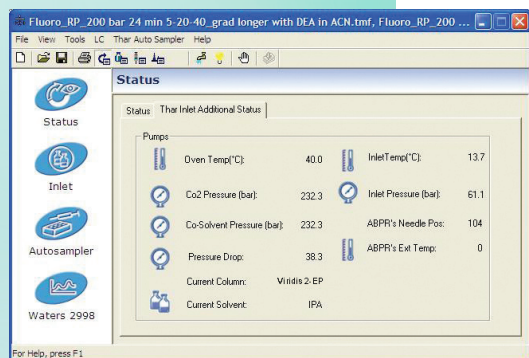
Embedded hardware control of all SFC components provides for complete integration into existing workflows.

Resolution SFC MS System

Often used for achiral method development for library purification, the Resolution SFC MS System allows rapid screening of difficult to separate achiral samples in chemistry laboratories and combines the detection power of mass spectrometry with the analysis and separation power of SFC.

The result is an easy-to-use SFC/MS platform which allows LC users already familiar with MassLynx or Empower software to quickly integrate SFC into their existing workflow with very little training. Faster than traditional normal-phase HPLC, and with higher resolving power, the speed of SFC separations combined with the detection capabilities of MS give you an unsurpassed normal-phase solution for rapid sample analysis and characterization.
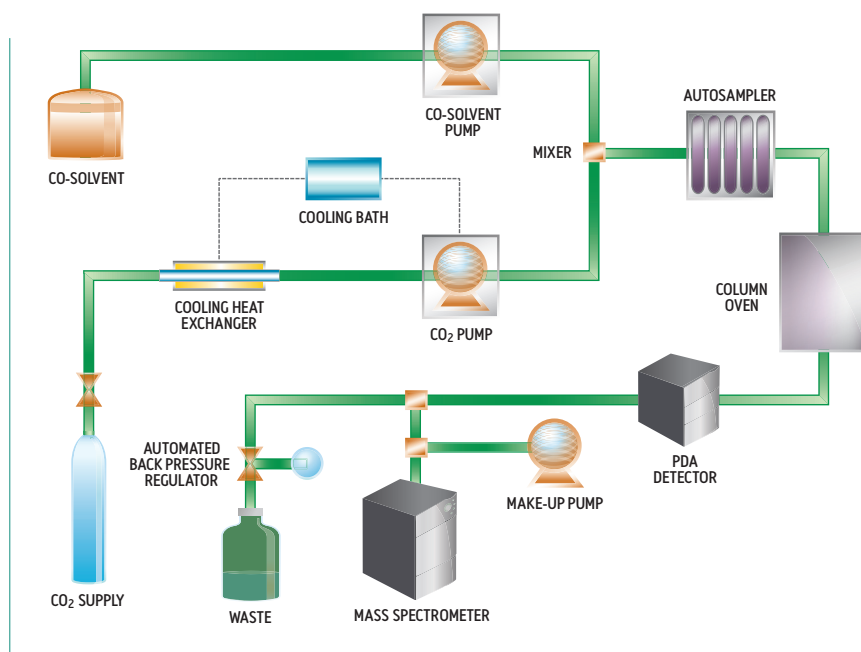
Analytical SFC incorporates cooling technology and automated back pressure control, which is required for the precise and accurate delivery of CO_2. With six co-solvent and ten column selection capability, as well as multiple detector options, the system offers unsurpassed flexibility for both routine sample analysis and multi compound screening.

Resolution SFC MS System.

SYSTEM COMPONENTS

Fluid Delivery Module

The Fluid Delivery Module is specifically designed to meet the demanding needs of CO_2 delivery and features a CO_2 pump and co-solvent pump for a seamless integrated solution. The module offers up to six co-solvents using an integrated co-solvent selection valve and also includes a heat exchanger, inlet CO_2 pressure sensor, and temperature sensor to provide and monitor optimal CO_2 delivery.

Autosampler

The Alias Autosampler gives maximum flexibility to users who require multiple or repeated analysis for method development or screening. This robust and proven autosampler accommodates sample handling formats such as 96 well plate or 96 deep well plate, 384 well plate, and 48 autosampler vials (1.5 mL).

Column Oven

The Analytical-2-Prep™ Column Oven is a thermal control module designed for use with SFC columns. The column oven's unique drawer design gives the user unprecedented flexibility and allows for fully automated column section.

Back Pressure Regulator

The Automated Back Pressure Regulator (ABPR) provides precise pressure control for supercritical fluids. The unit's valve assembly is motor-driven and temperature controlled to compensate for cooling during depressurization. A built-in pressure sensor provides a closed loop feedback for control and pressure alarm monitoring.

Mass Detector

The 3100 Mass Detector is a compact, single-quadrupole mass detector that provides selectivity, sensitivity, and throughput with faster scan speeds. It offers rapid polarity switching and multi-mode ionization with simultaneous APCI and ESI for comprehensive compound analyses in a single injection.

UV Detectors

The 2489 UV/Visible (UV/Vis) Detector is a versatile dual-wavelength absorbance detector. It offers the high sensitivity required for routine UV-based applications to low-level impurity identification and quantitative analysis.

The 2998 Photodiode Array (PDA) Detector offers advanced optical detection. Its integrated software and optics innovations deliver high chromatographic and spectral sensitivity. Enhanced software control provides flexibility for simultaneous 2D and 3D operation with Empower, MassLynx, or ChromScope software.

Caffeine, Nominal conc.: 2.0 mg/mL, 0.00125% of nominal conc., LOD @ 25 ng/mL
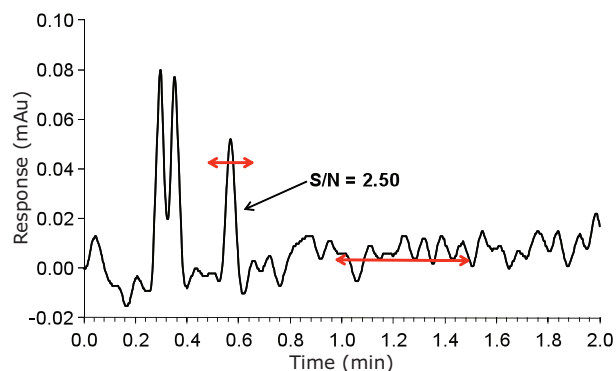
The use of reference wavelength compensation on the 2998 PDA Detector improves sensitivity at low sample concentrations. This effectively mitigates common background noise and, on average, results in a 3- to 5-fold improvement in the signal to noise ratio.

Method Station SFC System.

WATERS GLOBAL SERVICES

Waters Global Services focuses on optimizing Waters products with superior service, support, training, upgrades, and Waters Quality Parts.®

Only the Waters Service team has the most in-depth and up-to-date knowledge of the advanced science and technologies that provide the foundation for Waters systems. This knowledge enables Waters to maximize system uptime, increase laboratory productivity, and help you meet stringent compliance requirements.

Waters offers a range of service plans that meet your needs and provide lowest cost-of-ownership. Only Waters can provide the quality of support that ensures that your Waters system will operate with optimum productivity and meet compliance requirements.

With more than 94 offices in 50 countries, Waters maintains a strong global presence. Whether your company is a single-location lab or a large multinational organization, Waters Global Services provides you with the expertise and responsiveness you need.

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