Системы экстракции сверхкритической жидкости SFE
Описание

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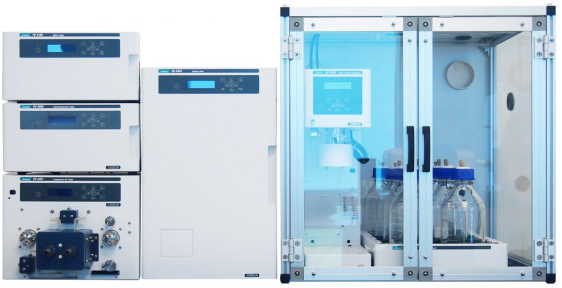
Supercritical Fluid Extraction (SFE) Systems

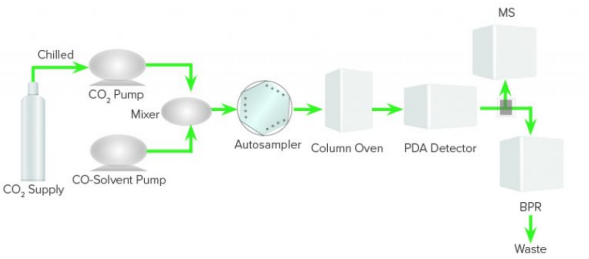
Supercritical fluid extraction (SFE) uses a supercritical fluid as an extraction solvent. Selective extraction can be made by exploiting the properties of differential solubility of target analytes in a wide variety of matrices.

Supercritical Fluid Extraction (SFE) Systems



Supercritical Fluid Extraction employs a supercritical fluid, most commonly CO_2, as the A mobile phase solvent for the extraction. The intrinsic low viscosity and high diffusivity of supercritical CO_2 has rendered SFE a faster extraction and higher efficiency technique when compared to traditional liquid extraction. This provides faster flow rates and thus faster extraction times without the requirement for a higher pressure system. The addition of a co-solvent to the CO_2 flow can help tune the strength further. The extraction oven can offer temperatures up to 100°C. Lastly after the extraction vessel is the back pressure regulator, which provides the back pressure requirement to keep the CO_2 supercritical, and is an integral part of the performance of the extraction.

Advantages



1. Selectivity – CO_2 polarity varies greatly depending upon the pressure it is exposed to. This makes CO_2 a tunable solvent which allows the user to find the precise conditions for extraction of the compounds of interest while leaving unwanted compounds behind. This inherent trait of CO_2 greatly reduces the need for post extraction cleanup that would be necessary with most solvent extractions.
2. No residual solvents – given the gaseous state of CO_2 at atmospheric conditions, the resulting extract does not require the long rotovap time needed to dry solvent extracted analytes.
3. Faster – given the high diffusivity and low viscosity of CO_2 in its supercritical state the extractions typically take a fraction of the time compared to solvent extractions.
4. Higher Yield – due to increased temperature and pressure, supercritical CO_2 can penetrate many matrices that solvents cannot thereby allowing for greater surface area contact which in turn increases yield.
5. Low Operating Cost – cost Per Extraction is significantly lower as the cost of CO_2 is much lower than the equivalent amount of solvent.
6. Environmentally Friendly

When compared to Soxhlet extractions, supercritical fluid extractions have proven to be capable of providing extractions up to 25 times faster with equivalent recovery while using up to 30 times less solvent.

Analytical SFE

- The analytical CO_2 pump offers built-in peltier cooling to maintain a stable CO_2 flow yielding excellent extraction 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 system can be configured for CO_2 only or 1-10 co-solvents, 1-10 extraction vessels for the vessel volumes listed above and 1, 6, 12 or 54 fractions.

System	Extraction Vessel	CO_2 Flow Rate
Analytical	1mL, 5mL, 10mL	0.2 - 10mL

Hybrid SFE

- The hybrid CO_2 pump offers a flow range from 0.5 to 20mL/min covering both analytical 10mL vessels up to semi-prep 100mL vessels. 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 system can be configured for CO_2 only or 1-10 co-solvents, 1-10 extraction vessels for the vessel volumes listed above and 1, 6, 12 or 54 fractions.

System	Extraction Vessel	CO_2 Flow Rate
Hybrid	10mL, 50mL, 100mL	0.5 - 20mL

Semi-Prep SFE

- The semi-prep CO_2 pump offers a flow range from 3 to 50mL/min covering 50mL vessels up to 200mL vessels. 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 system can be configured for CO_2 only or 1-10 co-solvents, 1-10 extraction vessels for the vessel volumes listed above and 1, 6, 12 or 54 fractions.

System	Extraction Vessel	CO_2 Flow Rate
Semi-Preparative	50ml, 100ml, 200ml	3.0 - 50mL

Prep SFE

- The Prep CO_2 pump offers a flow range from 5 to 150mL/min covering 500mL vessels up to 2L vessels. 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 system can be configured for CO_2 only or 1-10 co-solvents, 1-10 extraction vessels for the vessel volumes listed above and 1, 6, 12 or 54 fractions.

System	Extraction Vessel	CO_2 Flow Rate
Preparative	500ml, 1L, 2L	5 - 150mL

Benefits of using Super Critical Fluid Systems for Separation

High Solubility & Low Viscosity

Greater solubility and lower viscosity than liquid phase HPLC for faster column equilibration, faster separations and higher productivity.

Wide Molecular Structure Coverage

Applicable to a wide range of molecular structures with a wide range of polarities from strongly hydrophobic to strongly hydrophilic.

Environment-Friendly

SFC uses ‘green’ separation solvents – generally CO_2 with alcoholic modifiers – which are much greener than other solvents generally used in HPLC.

Cost-Effective

Dramatic reduction in solvent costs for both purchase and disposal.

Simple Operation

SFC easily scales-up from analytical to preparative, method transfer is simple and robust for both chiral and achiral sample purification.

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