Supercritical Extractor SFE-850M

Supercritical fluid extraction (SFE) is a technique uses supercritical fluid (e.g. CO_2) as organic solvent to extract organic component(s) from a solid matrix. Carbon dioxide (CO_2) is the most commonly used supercritical fluid.

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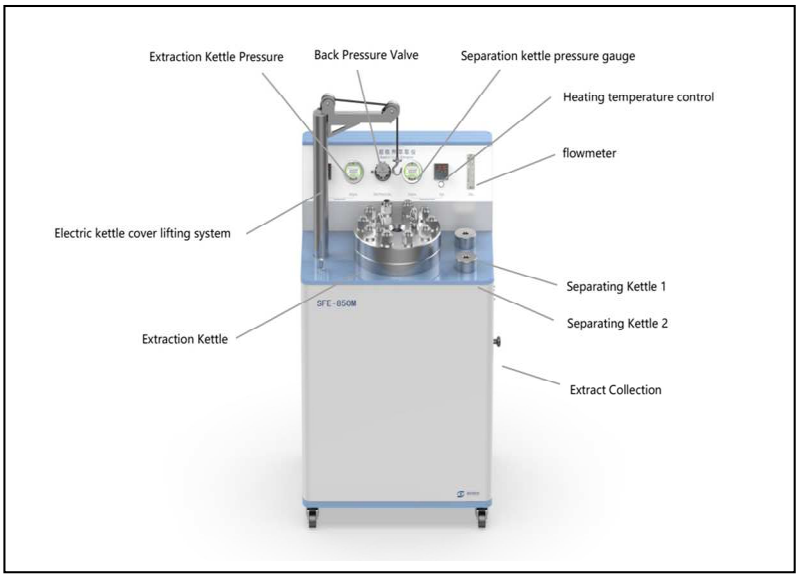

SFE with one extraction chamber and two fractionators

Working Principle:

When CO_2 is conditioned under the supercritical state (temperature >31.26°C, and pressure >7.29 MPa), it has an enhanced solvation effect on fatty acids, alkaloids, ethers, ketones, glycerides, and other organics. When supercritical state is reached, CO_2 is in close contact with the analytes in the sample matrix. With the high diffusivity and low surface tension of supercritical CO_2, the analytes would be dissolved, extracted, and collected (with the help of flowing fluid) easily. Because of difference in the properties (polarity, vapor pressure and molecular weight) of individual components, it is also possible to perform some degree of selective separation when two fractionators/collectors are used together but in different pressure and temperature settings. The ease of modifying the extraction and fractionators conditions could achieve certain level of separation/purification. Therefore, the process could also be treated as a combination of extraction and separation. Of course, the extracted and collected fractions so obtained under this process would not be 100% pure but would simplify downstream separation process.

Floor Model (850M)

Technical parameters:

1. **Extraction Chamber:** Volume of 3 L, 5 L, 10 L, 20 L, and 30 L are available. Fabricated with 316 Stainless Steel integrated processing. Heating system is temperature adjustable. Maximum working pressure 40 MPa, the number of extraction chamber can be increased to two (2); Sapphire viewing window is provided for observing the progress of extraction;
2. **Separator/Fractionator:** Volumes of 500 mL, 1,000 mL, 2,000 mL, 4,000 mL and 5,000 mL are available. Fabricated with 316 Stainless Steel and also equipped with heating system (temperature adjustable). The maximum working pressure is 20 MPa, and the number of separators can be increased to two (2);
3. **CO_2 high-pressure pump:** Flow rate of 40 L/hour, maximum working pressure of 40 MPa, with pre-refrigeration tank, and CO_2 recovery inlet. Constant flow and constant pressure mode is selectable through operating software.
4. **Co-solvent/Modifier pump:** flow rate of 0-100 mL/min and maximum working pressure 40 MPa are offered by the pump;
5. **Tubing control system:** globe valve + trimming valve + back pressure valve air flow control system, which can accurately adjust the pressure and fluid flow rate;
6. **Safety:** System is equipped with automatic pressure relieving system, overpressure would be automatic relieved to ensure operation safety;
7. **Heating system:** Electrical device provides heating range of room temperature to 150°C or 200 °C (optional), temperature control accuracy ±1 °C;
8. **Pressure display:** each extractor is equipped with an independent digital pressure gauge, which is convenient to regulate and observe the pressure change in the extraction chamber;
9. **CO_2 recovery system:** CO_2 recovery pump + double-stage gas purification device help recycling and re-using the CO_2;
10. **Motorized lifting device:** Electrical lifting system for chamber cover is included for easy lifting of the heavy cover and make operation simple and safe;
11. **Design concept:** Integrated design with rugged structure. Offers high degree of automation to achieve easy operation. High value performance suits future pilot trials.

Features & Benefits:

1. Integrated design with small footprint;
2. Overall design is simple and practical. Provides user-friendly operation;
3. Adopt more precise and exquisite valving and tubing system to improve pressure and flow accuracy under the premise of ensuring operation safety;
4. The precise design of the tubing system reduces the residue of the extract and improves the extraction rate, which is of great importance to valuable samples;
5. Special CO_2 high-pressure delivery pump offers constant flow and constant pressure operation. Small size with low noise operation is suitable for laboratory users;
6. Wide range of extraction chamber volumes from 3 L to 30 L are available. Bigger sizes could be built as per request;
7. Separation vessel with viewing sapphire window could monitor the process closely;
8. CO_2 recycling system keeps operation cost low and environmental-friendly.

Standard accessories:

- Flexible high-pressure CO_2 tubing, 1.5 M, connecting cylinders and instruments;
- External filter (filtration accuracy: 0.5μm), matching high-pressure hose;
- Special powder sample basket;
- 2 anti-static draining pipelines, each 1.5 M;
- Spare extraction kettle and separation kettle sealing rings (10);
- A set of installation tools;
- User manual and user guide;
- One-year warranty and lifetime free technical support.

User-supply items:

- CO_2 in cylinders with dip-tube (preferable);
- Modifier/Co-solvent (or other media)

Dimension of SFE 850M

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