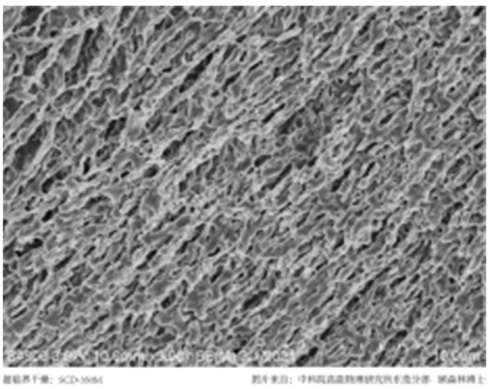
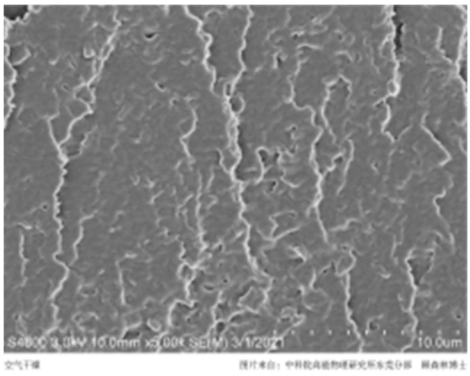
Manual Supercritical Dryer SCD-350M

Simple Working Principle:

Supercritical CO_2 has gas-like diffusivity and liquid-like solvation power under supercritical condition (temperature >31.26°C, and pressure >7.29 MPa). With its low viscosity and low surface tension, supercritical CO_2 can quickly penetrate into the mesopores and micropores of a solid matrix. Therefore, the rate of drying with supercritical CO_2 is much faster and efficient than that of traditional methods (by heating or freezing). During drying process, the sample could be "conditioned" with ethanol and then supercritical CO_2 solvates the "ethanol/water" complex and have the water carried out subsequently.



Supercritical Fluid drying



Warm air drying

Material (SEM images above): Drying of polyacrylate, comparison with traditional method

Features & Benefits:

1. Non-destructive drying and cleaning, which can be used for drying and cleaning of nano-materials, MOFs, aero-gels, biologicals, wafer, electro-mechanical precision parts and other high value samples;
2. Fully automatic design with touch screen display to monitor the drying process. Program control software interfaces with the drying process. During the drying process, color changes of the samples, drying time, real-time pressure, temperature, flow data and others, could be observed. Details and changes of the drying process could be monitored and adjusted throughout the process;
3. Multiple built-in material drying process methods. User-define drying methods could be set up, edited and saved;
4. Sample chamber is equipped with top CO_2 inlet and bottom liquid (water) outlet. This is convenient to perform sample placement and discharge the expelled liquid;
5. High-pressure sample chamber (with viewing window) size is available from 30 mL to 1,800 mL; Larger volume sample chamber can be custom built as option;
6. Normal working pressure of the dryer is 0-10 MPa, while the factory specification has a holding pressure of 15 MPa (2,150 psi) to ensure safe operation;
7. The dryer is equipped with an automatic overpressure relief system to ensure safety;
8. Automatic control of temperature and pressure to maintain the stability of system operation;

9. The top of the sample chamber is equipped with viewing Saphire window and lighting system for easy viewing the drying process;
10. Complete filtration system with external two-stage filter of built-in 0.5 µm filter to protect samples;
11. A variety of sample holders are available for dedicated samples;
12. Tubing and valves systems are made of 316 Stainless Steel which is compatible with supercritical CO_2 and ethanol;
13. Water bath-based cooling and CO_2 liquifying system is not needed with built-in compressor refrigeration system.;
14. Robust and corrosion-resistant enclosure with power supply, heating indicator

Standard accessories:

- Flexible high-pressure Liquid CO_2 tubing, 1.5 meters, connecting CO_2 cylinder and instruments;
- External filter (0.5µm), matching high-pressure hose;
- Powder sample and block sample holder;
- 2 anti-static draining pipelines, each 1.5 meters;
- Spare sample chamber seal (2);
- One set of installation tools;
- User manual and user guide;
- Free technical support for instrument life.

User-supplied accessories:

- Carbon dioxide in cylinders with dip-tube (preferable);
- 99.9% pure ethanol (acts as water co-solvent)

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