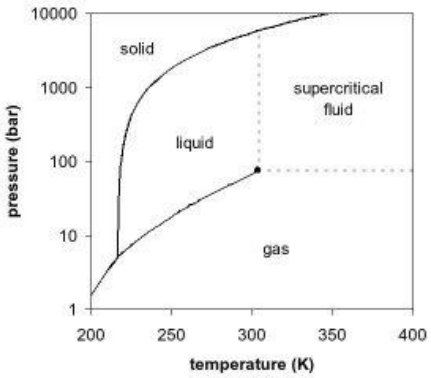
WHY USE SUPERCRITICAL CO_2 EXTRACTION?

Supercritical fluid extraction is a highly effective industrial process for streamlining the generation of cannabis oils from raw plant matter, including trim and buds. Supercritical fluid extraction reduces processing costs, increases yields, and improves the quality of extracted products while increasing throughput. It would be tough to find a process that matches the precision of CO2 extraction. The temperature-dependent solubility of compounds in pressurized carbon dioxide was first discovered over a century ago, yet the commercial applicability and practicality have grown immensely since those early experiments were first performed.

What is a supercritical fluid (SCF)?

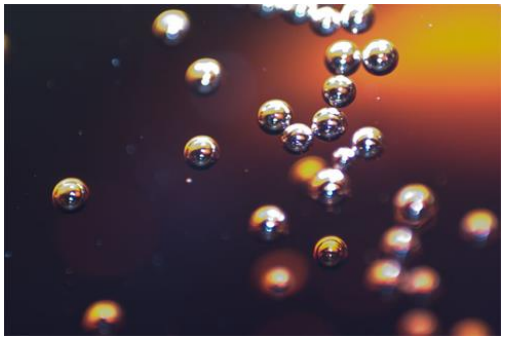
Supercritical fluids represent a distinct phase of matter that behaves as an intermediate between liquid and gas. These fluids exceed their critical temperature and pressure to enter into the supercritical phase, which dissolves substances like a liquid but fills space like a gas. Carbon dioxide's critical point is 31 °C and 1072 psi.



THE BENEFITS OF CARBON DIOXIDE

Carbon dioxide is a non-toxic, non-flammable solvent with low environmental impact that reduces VOC emissions when compared to other industrial solvents. High-purity CO_2 is widely available at low cost, keeping operating expenditures to a minimum. Furthermore, CO_2 is generally recognized as safe (GRAS) by the FDA.

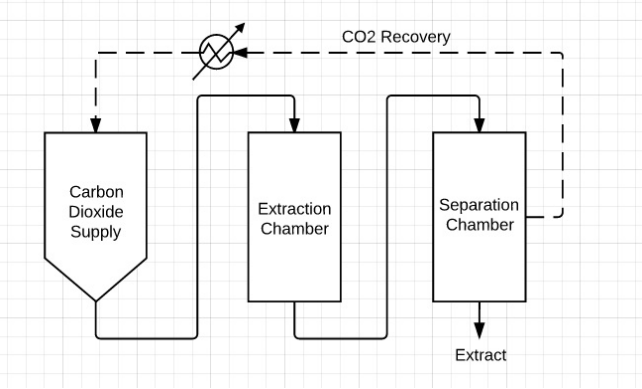
Physical properties of CO_2 allow for selective extractions of specific botanical oil fractions. The solubility of various plant compounds is highly sensitive to the temperature and pressure of supercritical carbon dioxide. CO_2's high vapor pressure at ambient temperatures means that process temperatures can be kept low, which minimizes degradation of thermally sensitive materials.



Carbon dioxide is capable of dissolving a wide range of compounds in concurrence with an amphipathic cosolvent modifier, and it cannot be oxidized so it is especially useful in high-pressure oxidation reactions. CO_2 is often recycled from industrial waste streams, so extractions using this green solvent have a net neutral impact on atmospheric greenhouse gas emissions.

Advantages of CO_2 over Organic Solvents

Supercritical CO_2 equipment can be utilized for subcritical extractions that target different ranges of constituents, and closed-loop systems are able to recycle solvent to minimize operating costs. Multistage extractions and solvent fractionation have the ability to significantly improve product purity and selectivity.



With carbon dioxide, there is virtually no risk of residual contaminants from the solvent left in the product. Organic solvents such as propane, butane, and ethanol may leave impurities in your product. Hydrocarbon solvents often require heating to remove the solvent, which results in denaturation of valuable botanical compounds whereas CO_2 extraction processes do not require substantial heating. Low process temperatures ensure that low-boiling aromatics are not lost from the botanical extract during the separation step.

Carbon dioxide eliminates costs associated with purchasing equipment designated for hazardous locations. Explosion-proof electrical equipment can be a costly expense for operations utilizing flammable organic solvents.

RELATED INDUSTRIAL APPLICATIONS

- Terpene Removal and Recovery
- Decaffeination of Tea and Coffee
- Flavor and Aroma Concentrates
- Pharmaceuticals
- Hops Oil Extraction for Brewing
- Nutraceuticals and Herbal Concentrates
- Cosmetics
- Microchip Manufacturing