Research Services

Supercritical Fluid Extraction, Processing and High Pressure Chemistry

- Concept Feasibility Studies
- Proof of Concept
- Process Development
- Process Optimization
- Toll Processing

Fundamental research is the first step in scientific discovery, development, and ultimately the commercialization of a process. Supercritical Fluid Technologies (SFT), a global leader in supercritical fluid extraction, processing, and high pressure chemistry, can help make this first step a success. Our knowledgeable scientists will assist you in identifying where high pressure or supercritical fluid processing techniques will yield breakthroughs that you can use to improve your processes and products.

Supercritical Fluid Technologies' contract research program offers a range of services from simple feasibility studies to advanced method (process) development projects. Often, a "proof of concept" can be demonstrated in our laboratory for a nominal cost. This kind of information, real data about your materials, is vital to making decisions and committing resources to a project.

Basic feasibility studies usually consist of several experiments and will run from one to four days. The purpose of a feasibility study is to determine whether a supercritical fluid technique is appropriate and can be applied successfully for a specific material or class of materials.

Phase 1 and Phase 2 method development goes beyond the initial feasibility study where detailed processing parameters are optimized for a given product. When this development work is completed, larger amounts of materials can be produced for comprehensive analysis, clinical trials, or marketing purposes.

Toll processing is sometimes the best path to take when a material is required on an infrequent or one time basis. SFT provides toll processing services for small batches of materials (several liters or kilograms per run).

When experimental work in the laboratory is successful, the data obtained is often used as a primary consideration in the justification for purchasing supercritical fluid processing equipment. As a manufacturer of SFE/SFR equipment, Supercritical Fluid Technologies can provide the equipment necessary to transfer what is learned in our lab, to your lab and ultimately to your production site. As an additional benefit, SFT provides up to a 50% credit towards the purchase of equipment.

All experimental work performed in Supercritical Fluid Technologies' laboratory is carefully supervised by the company's research director, Dr. Kenneth James. Dr. James earned his doctorate from the Department of Chemistry and Biochemistry at the University of Delaware. He has over 10 years of experience working with supercritical fluids. While at SFT, he has obtained several patents for the company and has written numerous papers on SFE, SFR, SF phase studies and material solubilities in supercritical fluids. SFT's laboratory is equipped with SFE/SFR equipment, high pressure chemical reactors, and SF view cells. The laboratory is located in Newark, Delaware.

Research Services

SFT's Key Research Capabilities:

1. Basic feasibility studies – "Proof of concept"
2. Phase 1 and Phase 2 method and process development
3. Small scale toll processing
4. Chemical intermediate synthesis
5. Justification for SF capital equipment purchases

A Few Examples of Successful Applications:

Extractions:

- spices, herbs, and essential oils
- nutraceuticals and vitamins
- flavors and fragrances
- monomers and oligomers from polymers
- electronics cleaning
- medical implants cleaning
- protein and biologically active material purification
- nano tube formation and cleaning
- resistive stripping and cleaning of wafers
- aero gel formation

Reactions:

- organic and inorganic synthesis
- catalysis and hydrogenation
- pharmaceutical compound synthesis
- polymeric synthesis