

# **SUPERCRITICAL FLUIDS AS ENVIRONMENTALLY BENIGN SOLVENTS FOR THE CHEMICAL INDUSTRY.**

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## **ABSTRACT**

The Greenchemistry Centre of Industrial Collaboration (CIC) is a new R&D not for profit service linking academia and business. It is a joint venture between the universities of York and Leeds and the Government Central Science Laboratories at York We aim to help companies develop the innovative products and processes, which will enable chemical production that is not only more profitable, but also less wasteful, less damaging to the environment, and more socially acceptable. We are dedicated to improving chemical processes and products for industry through implementation of the principles of Green Chemistry and the application of new chemistry and novel technologies in areas of synthesis, catalysis, renewable resources, specialised reactors, analytical chemistry and alternative solvents.

Although higher capital costs might be required, the application of supercritical fluids as alternative, greener solvents in industrial processes they can not only greatly improve the environmental performance through elimination of toxic solvents but also benefit the process economics through ease of product separation and waste minimisation. They are already widely applied in areas such as extraction technology, chromatography or dry cleaning. However, supercritical fluids are more than just replacement solvents. Supercritical fluid technology and its applications is a major area of expertise and interest in the Green Chemistry CIC.

Our scope of expertise in supercritical fluid technology extends to a range of applications some of which will be detailed in the presented poster. These include:

- Extraction of natural products from plants;
- Fractionation and chromatography;
- Particle formation and polymer processing;
- Dyeing and impregnation;
- Chemical reactions;
- Fundamental studies of supercritical fluid properties to control selectivity and kinetics;
- Catalytic applications and the development of ligands enabling metal solvation in supercritical fluids;
- Synthesis of novel materials based on renewable resources.

Applications are based on research using state-of-the-art reactors and extractors and extend to semi-scale/commercial scale facilities. The wide range of applications demonstrates the great commercial potential of this technology. A more wide spread implementation can benefit not only the environment but also economics of industrial chemical production. The Greenchemistry CIC is committed to the development and utilisation of this technology through new and existing industrial collaborations.