



## **NANO/MICRO-EMULSION MANUFACTURING WITH SUPERCRITICAL CARBON DIOXIDE**

ID# 2019062

### **HIGHLIGHTS**

- Versatile production method for nano/micro-emulsions with long-term stability
- Manufacture emulsions with lower energy input and at lower temperatures

### **OPPORTUNITY**

A team of researchers from the University of Alberta has developed a versatile new method to produce nano- and micro-sized emulsions with long-term stability using supercritical carbon dioxide. This new production process can be performed in batch, semi-continuous, or continuous modes, and has been designed so that moderate changes to its operating conditions provide manufacturers with significant control over the properties of the resulting emulsions, including droplet size and size distribution. This method can operate with lower energy input and at lower temperatures compared to conventional emulsion production processes, and it does not require the use of organic solvents.

This new production method leverages the unique solubility properties of supercritical carbon dioxide to enhance the manufacturing of emulsions. It can be used to produce oil-in-water or water-in-oil emulsions employing different types of oils, surfactants, and stabilizers.

### **COMPETITIVE ADVANTAGE**

- Existing emulsion manufacturing facilities can be updated with the addition of high-pressure equipment to integrate supercritical carbon dioxide into the process.
- Moderate changes to the pressure and temperature of supercritical carbon dioxide can be used to fine tune its physicochemical properties, providing control over droplet size and size distribution in the final emulsion.
- The use of lower energy input and lower temperatures makes this process better suited for manufacturing emulsions with heat-sensitive compounds.
- The emulsions can be loaded with different types of bioactives during emulsion formation as delivery systems.

### **STATUS**

- Patent Pending

### **INVENTORS**

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### **MORE INFORMATION**

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