

MiFlow (Microwave Assisted Flow Reactor)

Technology: Microwave Chemistry/ Process Intensification

Industry: Chemical

Project Overview:

MiFlow is a 2 year applied R&D collaborative Eurostars funded project between two innovative SME's, which aims to develop a novel microwave assisted flow reactor to allow scalability of reactions with minimal process development.

Capabilities:

The capabilities of the continuous flow microwave system give it several key advantages over traditional batch processing:

- Faster reaction times - 10-1000 times faster than when using conventional heating
- High throughput – using these fast reaction times coupled with a system throughput of up to 1L/min a possible 100 kg/day can be processed.
- Cost – low maintenance requirements
- Quality – shorter contact times and therefore a lower probability of side reactions.
- Higher reaction temperatures – Large scale batch chemistry is generally limited to temperatures <150°C, but using microwave flow chemistry it is much easier to access temperatures >200°C and, in addition, as the inventory of hazardous materials is much lower it is also much safer.

User Trials:

The MiFlow reactor will be trialled by Solvionic who manufacture ionic liquids. The development of continuous flow processes for ionic liquids production will decrease production costs thanks to better yields and reduction of waste and energy consumption.



C-Tech Innovation's prototype microwave flow reactor

C-Tech Innovation and Solvionic will develop a highly energy efficient microwave flow reactor and using ionic liquid based processes will compile a large amount of evidence to demonstrate the benefits of carrying out large scale reactions in a microwave flow reactor.

Project Consortium: C-Tech Innovation (UK) - design and build of MW flow reactor
Solvionic (France) - testing of ionic liquid based reactions in reactor

Project Number: E! 6805

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