

Intensified Devices for Multiphase Operations



Post-doctoral position from January 2023 – December 2023

This post-doctoral researcher position is available to undertake research in the area of development and scale-up of intensified fluidic devices for multiphase operations with specific focus on anti-solvent crystallisation. The goal is to develop and use intensified fluidic devices such as fluidic oscillators and vortex diodes for controlling mixing of anti-solvent and solution streams as well as nucleation, growth and particle breakage so as to achieve desired crystal size distribution (CSD). The on-going research on laboratory scale development of fluidic oscillators and vortex diode will be leveraged to develop and validate scale-up and/or numbering-up methodologies. The scaled-up/numbered-up devices will be fabricated and a continuous anti-solvent crystallisation set-up will be established to produce at least 1 kg/day product at steady state. The performance of such a demonstration unit will be benchmarked by comparing with a reference case of stirred crystalliser. The successful candidate will have the opportunity to work with existing PhD students working on these devices. A thorough knowledge of crystallisation, particularly anti-solvent crystallisation, PAT for measuring CSD and experimental techniques for characterising crystalline products is essential. Experience in using computational models and population balance models for simulating crystallisation is highly desirable. The candidate is expected to develop and validate a demonstration anti-solvent crystallisation unit based on intensified fluidic devices like fluidic oscillators and vortex diode with at least 1 kg/day nominal capacity.

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**Multiphase Reactors &
INtensification Group**

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