In line work-up for flow chemistry

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Flow chemistry is an emerging approach in pharmaceutical and fine/specialty chemicals processing. While reactor's technology has made substantial progress in the last decade, in line work suitable for flow- based process integration is still lagging behind.

We present here a membrane based liquid-liquid separation technology that enables work-up in flow chemistry set-ups. Traditionally liquid-liquid (LL) extraction is achieved by agitating a separatory funnel (for mass transfer) and then waiting for gravity based separation to take place. In flow, the agitation is achieved inside the flow channels, and separation can continuously be achieve with this technology.

The separation units are modular hence they can be used individually in the context of a process or, they can be used in sets to achieve multistage operation. The technology is scalable thus providing solutions from the laboratory scale to the pilot plant and to the production floor with seemsless scale up. It can quickly break emulsions and separate liquids with same density with negligible hold-up volumes.

After presenting the theory of the device, we'll provide examples of use in the flow chemistry context in processes with a different degree of complexity. Examples will include synthesis and purification of pharmaceuticals, examples of process scale up, single and multistage operation.

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