

Press release

Microreactor technology: from milligrams to production

Nijmegen, the Netherlands, July 1st 2009 — Access2Flow, with its members FutureChemistry, Flowid and Micronit Microfluidics, has shown the fast scalability and applicability of microreactors in a case study for flow chemistry. For the case study, the Paal-Knorr reaction was used as a model reaction. This exothermic model reaction was optimized fully automated in three parameters and subsequently scaled up to small production volumes.

For this scale up step, new parallel mixing reactors were designed and implemented. A production rate of 55 gram per hour could be reached with this device, giving an overall scaling factor from optimization device to preparative lab scale of 1250. Further parallelization of the reactors will increase the production rate up to kgs per hour, being interesting for the production of high added value chemical compounds.

Major benefits of the flow chemistry route vs. conventional batch chemistry in this particular case proved to be the safe and easy operation of an exothermic reaction, fast development time of approximately 200 man hours and low reagent consumption during optimization.

Access2Flow functions as a so-called 'one-stop shop' for the chemical and pharmaceutical industry by allowing synthesis reactions to be carried out in a continuous-flow system. Processes that have always been performed in small batches can now be turned into continuous processes. With this technology, the production of chemical compounds can be done faster, more efficiently and safer. Furthermore, the continuous flow reactors can easily be scaled to include reaction volumes of tens of millimetres and even more.

Being a dutch consortium, each of its members of the three companies brings their respective areas of expertise to the table. Micronit has years of experience in manufacturing glass microreactors. FutureChemistry has experience in testing, optimizing and implementing chemical processes in these microreactors. Furthermore, FutureChemistry develops and supplies automation equipment to control continuous flow reactors. Flowid is a process engineering company with the expertise to implement microreactor systems on an industrial scale.

General Manager of Flowid Jeffrey van den Berg about this case study: "The results perfectly illustrate the microreactor potential for the chemical en pharmaceutical industry. While maintaining optimal reaction conditions the productivity is scaled up in a short period of time. By controlling the chemistry it's possible to optimize those factors which are crucial for a specific reaction. Besides the economic viability this could be factors like conversion, scale up speed, yield or safety. Access2Flow is more than willing to determine the advantages of this technology based on company specific cases. Therefore we would like to invite companies to contact us".



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Parallel multi-layered reactor module for the production of chemical compounds