

Flow Chemistry: Enhancing Safety, Accelerating Processes, and Optimizing Quality & Yield

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Abstract: Flow chemistry, also known as continuous processing or continuous flow chemistry, involves the controlled introduction of multiple reactant streams into a reactor, such as a tube, microreactor, or chamber, where the reaction occurs before the resultant compound is collected. This approach enables sequential processing through additional reactor loops to obtain the final product. The use of small reagent quantities significantly enhances safety while allowing reaction conditions that may be challenging or hazardous in traditional batch processing. Continuous flow technology offers advantages such as reduced impurity levels, improved product quality, and shorter reaction times.[1-5]

Although widely utilized in the chemical industry for decades, flow chemistry is now gaining traction in pharmaceutical and fine chemical manufacturing due to its inherent benefits. These include increased safety, cost-effectiveness, and enhanced production flexibility, making it an attractive alternative to conventional batch processes.[6-10].

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