

Flow Chemistry

Ensuring faster, safer and accurately reproducible results with Flow Chemistry

Flow chemistry, also known as continuous flow or plug flow chemistry involves a chemical reaction run in a continuous flow stream of reagents. The process offers potential benefits in terms of efficiency, reduced impurity formation, higher yields & better safety. Flow chemistry can also give access to hazardous reactions where handling larger inventories of reagents and reactants should be avoided for safety reasons. The skilled and experienced flow chemistry team at Sai Life Sciences is colocated with the development facility and offers the entire array of services in our well-equipped and customized technology suite along with provision for scale-up.

Highlights

- Credited with successful synthesis of specific compounds and optimization of processes
- Proof-of-Concept completed more than 30 chemical processes for various projects
- Optimization (up to 50g scale) completed more than 15 chemical processes.
- Scale up (kilo gram scale) successfully completed 4 chemical processes.
- Successfully delivered 500g final compound tetrazole ring formation followed by azide reaction with sodium azide reagent.
- Optimized Grignard reaction followed by cyclization reaction in the lab up to 250 g scale
- Enhanced reaction conversion and selectivity for Debenzylation reaction with 1M BCl₃ optimized the conditions up to 10 kg scale.
- ATFE distillation process optimized with shortened residence time
- LLE process for dichloromethane optimized with reduced time and water consumption
- Experience in vast range of chemical reactions - nucleophilic substitution, Oxidation, cyclization, aldehyde preparation, debenzoylation, Tetrazole formation, azide formation, methylation, Grignard reactions & Heck reactions, Bromination and more
- Safely handled highly sensitive chemicals like n-BuLi, i-PrMgCl, LiCl, BCl₃, Br-CN, NaN₃, TBAA
 - Gas-Liquid reactions: Carbonylation reaction with CO gas
- Well-qualified and experienced scientific team.

Comprehensive capabilities

- Spanning Lab - Pilot - Plant
- State-of-the art technology suite with significant expansion capacity
- Infrastructure also includes process development, optimization, and early supplies
- Development capability co-located with flow chemistry with a range of complementary equipment that supports continuous unit operations



Infrastructure

- Vapourtec – 2mL to 10ml standard tubular reactors (PFA, HA-276 & SS) & Column reactor (5 mL) Standard cryo reactor (2+8mL), Static mixer reactors (20 mL)
- Agitated Cell Reactor (Coflore-ACR from AM Technology) 100 mL volume
 - Pinched tubular reactor (100 mL volume, SS & HA-276)
 - Indigenous coiled reactors with 5 ml to 500 mL) High precise HPLC pumps and Peristaltic pumps (flow range from 0.01mL/min to 100 mL/min) 2L and 4L Hastelloy reactors with all the accessories for scale up
- Short-path distillation
- Agitated Thin Film Evaporator (ATFE)
- Liquid-Liquid Extractor (LLE)
- Process Analytical Technology (PAT) with REACT-IR
- Flow photo chemical reactor of 2ml, 10ml and 50ml with wide range of light intensity

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