

## New technology platform



## Key Figures

- **120+** chemists & engineers
- **5 sites** with flow chemistry service
- **100,000+** reactions per year
- **90%+** success rate
- **kg+/d** output



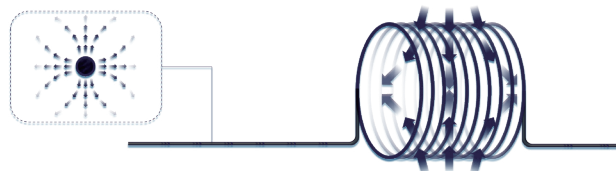
## Reaction Types

- **Photochemistry**,  $\lambda = 254\text{-}455\text{ nm}$
- **Hydrogenation**, 81 supported catalysts
- **Metalation**, all types of Li, Mg, Zn reagents
- **Diazotization**, coupled to X, OH, N<sub>3</sub>, CN, B(OR)<sub>2</sub>, H, etc.
- **Nitration**
- **Oxidation**, including using O<sub>2</sub> and O<sub>3</sub>
- **Reduction**
- **High temperature**, up to 300 °C and 10 MPa
- **Cross-coupling**, with supported catalysts
- **and many more**, including CH<sub>2</sub>N<sub>2</sub>, CO, SF<sub>4</sub>, etc.



## Why Flow Chem?

- Highly efficient mass & heat transfer
- More accurate control of reaction conditions
- Improved process safety
- Access to inaccessible conditions in batch



## Service Highlights

- Dedicated flow chemistry teams at Shanghai, Tianjin, Wuhan, Chengdu, Nantong sites
- Full experience from parameter optimization to reaction up-scaling
- Supporting both FTE & FFS projects *free of charge*

### Safety



### Yield



### Efficiency



### Cycle time



### Selectivity



### Scalability



### Reproducibility



### Cost



## Photochemistry

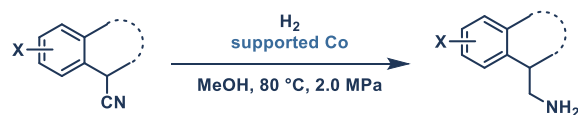


Batch: **<10%, NBS, AIBN, CCl<sub>4</sub>.**

Flow: **75%, 1.1 kg in 90 min.**



## Hydrogenation 81 supported catalysts

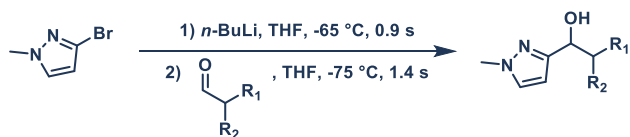


Batch: **Various amounts of dehalogenation.**

Flow: **86%, no dehalogenation. 80%+ lower in cost.**



## Metalation

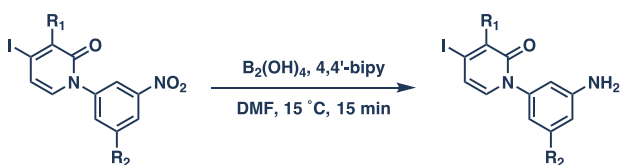


Batch: **10%; several side reactions from Li migration.**

Flow: **81%, 200 g in 1 h.**



## Reduction

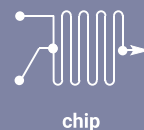


Batch: **80%; strong exotherm.**

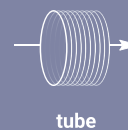
Flow: **96%, 100 g in 90 min. No deiodination.**



## Reactors



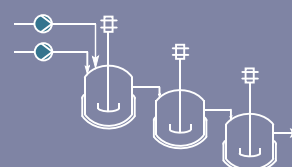
chip



tube



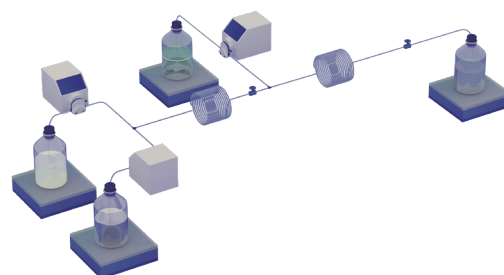
fixed-bed



CSTRs  
(Continuous Stirred Tank Reactors)

## Internal Records

- 10 kg in 31 h (non-stop)
- 60 kg of single compound delivered



## Disclaimer

This presentation is solely for discussion and informational purposes. It does not constitute an offer to provide the compounds mentioned. Any order placed will be subject to a thorough IP risk assessment. We will only accept orders for synthesis services if it is determined that no third-party intellectual property rights are infringed.