

# Reaction kinetics

## The key to productivity

**High product yields and low production costs** - these are typical targets of process optimization. Optimization based on production knowledge and experience often succeed and deliver maximum yields and reproducibility. However, if a process is limited by complex reaction kinetics the optimization potential depends on the understanding of the kinetics (fig.).

**The key to reaction kinetics** lies in the measurement of precise reaction data for which our experts use a combination of new and established tools. Standardized and tailor-made reactor systems with modular components enable fast and efficient experiments in semi-batch or continuous processes or with micro reaction technology. Based on experimental data the reaction kinetics are determined and critical process parameters are deduced. Various scenarios can be simulated once the kinetic model is established. Reactor and process optimizations **become possible on the basis of an extended process understanding.**

**We answer your open questions about reaction kinetics** and help to realize optimization in your process. With new process understanding it is often possible to achieve high benefits with little change in the process. This benefit is our ambition. The advice of our experts is manufacturer independent no matter if a single apparatus or a whole new process is your concern.

### Project Examples

- Scale-up of a nitration
- Production of a Grignard- reagent (semi-batch) with subsequent addition (continuous)
- Modeling of an emul-sion copolymerisation
- Combination of semi-batch and field test experiments for a gas-liquid reaction
- Transfer batch-to-continuous of a carbo-lithiation with up-scaling from bench-scale to ~ 100t/a
- Process Design Packages for MRT-plants

### Interested? Contact us!

Engineering & Consulting  
PD PA SE&C EC  
team-ec.industry@siemens.com  
Tel.: +49 (69) 797-84500

### Your Benefit

- Higher product yields
- Higher process stability
- Better product quality
- Controlled scale-up
- Low operating costs

### Our range of services

- Experimental studies in reaction calorimeters
- Micro reaction technology
- Various reactor types for multi-phase systems
- Reaction and Reactor modeling (e.g. Presto®, Aspen®)

