



CFD Reactor Consultancy

Rapid, safe and economic chemical reactor design, optimisation and scale up.

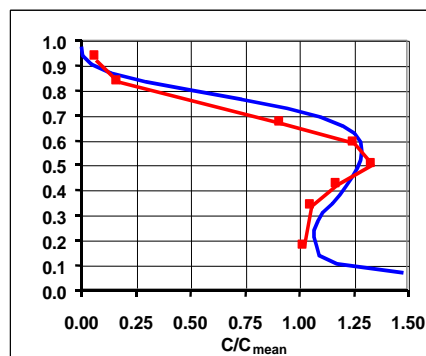
- Faster time to market
- Improved product quality
- Increased yields and purity
- Rapid payback
- Reduced Waste
- Lower operating costs
- Start up right first time
- Rapid and reliable scale up
- Reduced separation costs
- Higher profitability
- Safer cleaner process
- Reduced CAPEX

Markets

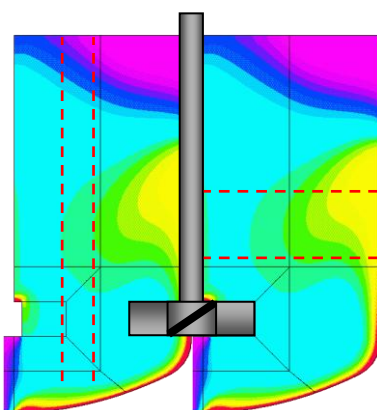
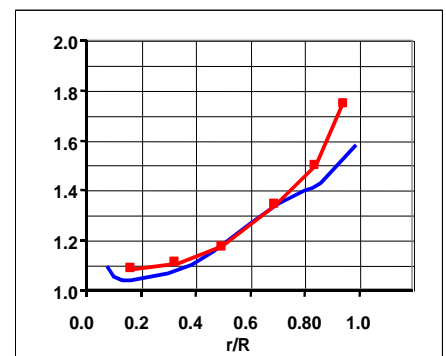
- Fine chemicals
- Speciality chemicals
- Pharmaceuticals
- Bulk chemicals
- Polymers
- Petrochemicals
- Agrochemicals

Validation of CFD prediction of solids distribution

R/3 from the wall



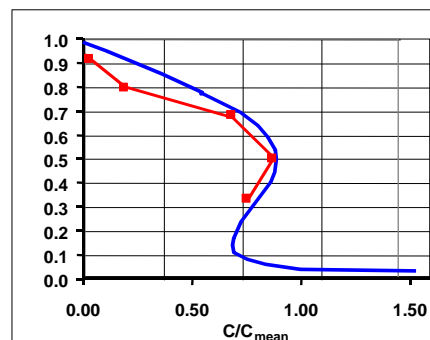
H/3 from the top



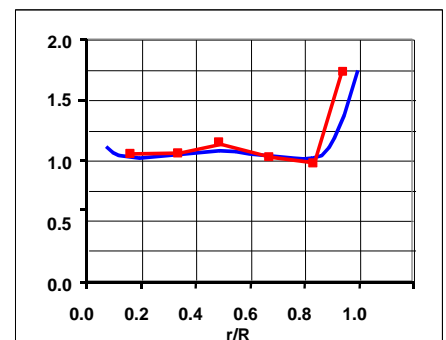
Concentration contour plot
- - - Measurement line

—■— Measurements
— CFD

R/2 from the wall

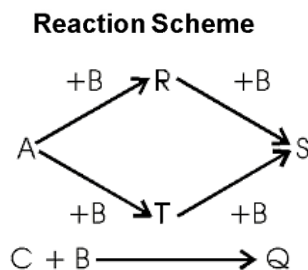
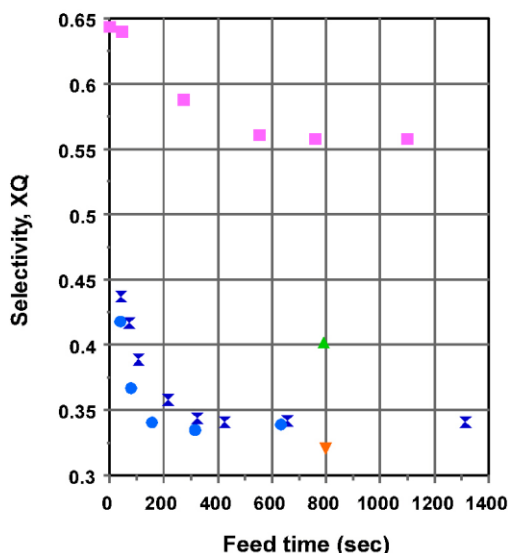


2H/3 from the top



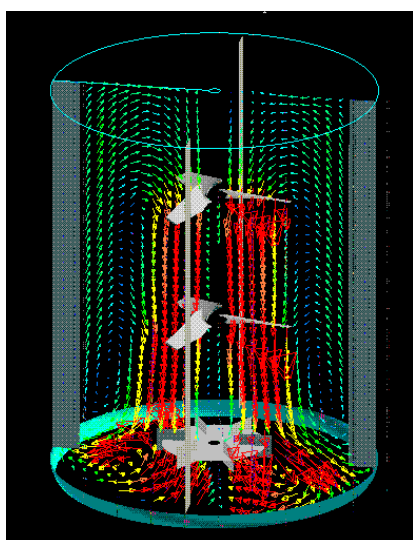
CFD Modelling

Effect of feed time and arrangement on by-product formation in semi-batch micromixing-controlled reaction



Feed arrangements

A B C D E
 x ■ ● ▾ ▲



Flow pattern in multi-impeller STR

BHR Group is an international centre of fluid mixing expertise and knowhow in the design, optimisation and scale-up of chemical reactors for single-phase, two-phase and multiphase processes. Expertise in CFD modelling, chemical engineering and chemistry is backed by unrivalled pilot and production-scale experimental facilities for model validation.

Contact us or see our website for more information

P-17

Office contact information:

Telephone: +44 (0) 1234 750 422
 Facsimile: +44 (0) 1234 750 074
 Email: contactus@bhrgroup.co.uk
 Website: www.bhrgroup.com

The Fluid Engineering Centre
 Cranfield, Bedfordshire
 MK43 0AJ
 United Kingdom



Global Experts in Fluid Engineering

Applications

- Bespoke model development
- Crystalliser optimisation
- Reactor design (STR bubble column, NIMIX, static and rotor-stator mixers, packed beds, fluidised beds, reciprocating agitation)
- Reactor optimisation
- Reactor scale up
- Parameter sensitivity studies
- Temperature control strategies
- Monometer/initiator dosing strategies
- Equipment rating

Parameters

- Velocity and turbulence fields
- Concentrations of reactants, products and by-products
- Temperature profiles
- Gas hold up
- Particle size/chain length distributions
- Solids distributions
- Residence time distribution
- Power draw
- Mix times
- Heat transfer coefficient
- Fluid rheology
- Changing property effects

Processes

- Single liquid phase flow
- Multiphase flow
- Mixing and reaction
- Crystallisation
- Polymerisations
- Heat and mass transfer
- Integration of micro mixing and reaction kinetics into CFD
- Integration of population balance models
- Particle tracking
- Non-Newtonian rheology