

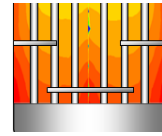


Managing technical risk

Modelling of Fischer-Tropsch reaction

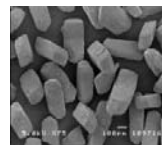
What is helping GTL companies to ...

... design new **high-performance reactors** ?



... optimise **catalyst design** ?

... **scale-up new designs** easily?



The answer is **Advanced Process Modelling**, a technology that allows important design and operation decisions to be based on accurate quantification.

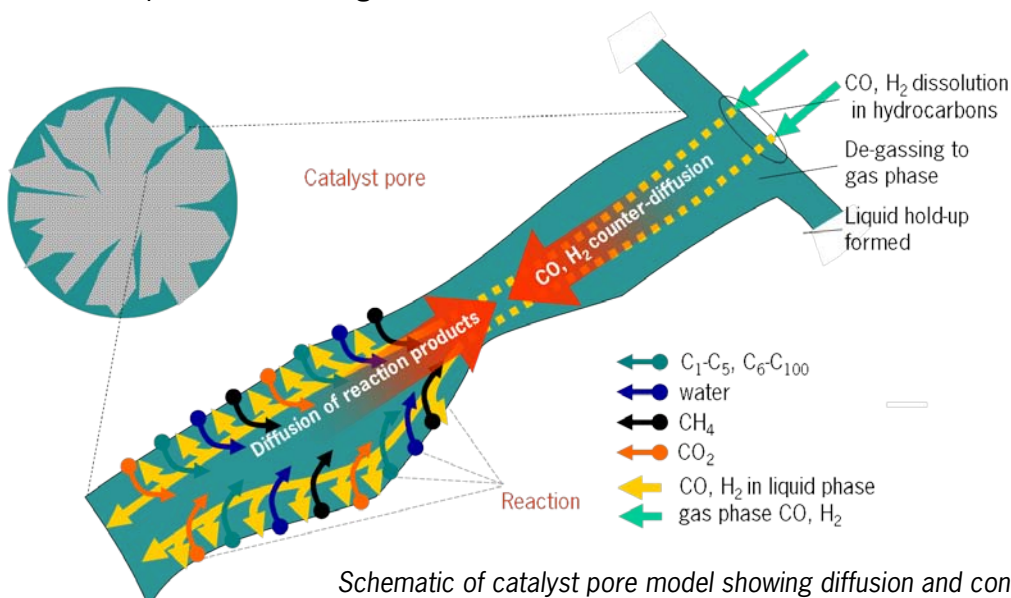
Similarly, **Model-Based Innovation** techniques are helping to integrate R&D with engineering design, to ensure optimal process design from the start.

“Modelling gave us ‘perfect insight’ into our multitubular reactor, resulting in a new high-performance design”

- LG Chem, Ltd

It's all in the pores

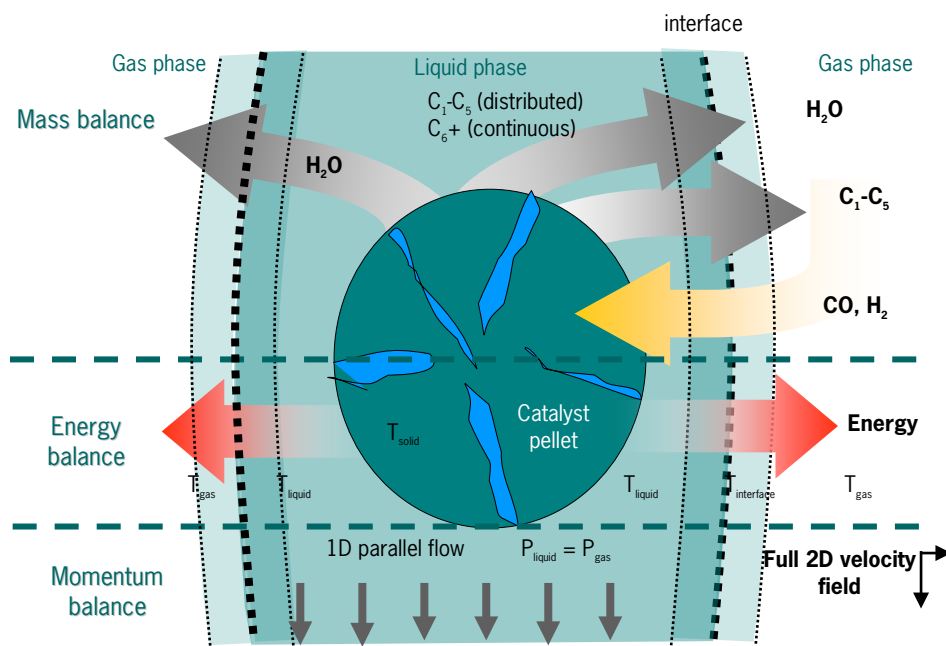
It may seem strange that what happens at a micron level inside catalyst pores is a key consideration in designing reactors of tens or hundreds of cubic metres' volume. But it is the microscale diffusion of gas, wax product and produced water that dictate the size and scale of equipment. This is where advanced process modelling comes in ...



Schematic of catalyst pore model showing diffusion and convection of reactants and products to and from catalyst sites

... and in the microspaces around a pellet

At the next scale, the multicomponent diffusion between bulk gas and the liquid phase surrounding the pellets has a significant effect on performance.



"We use gPROMS modelling to optimise our catalyst designs and extend customers' catalyst life."

- Christoph Bäumler,
Süd-Chemie AG

Reaction, diffusion and convection around a single catalyst pellet

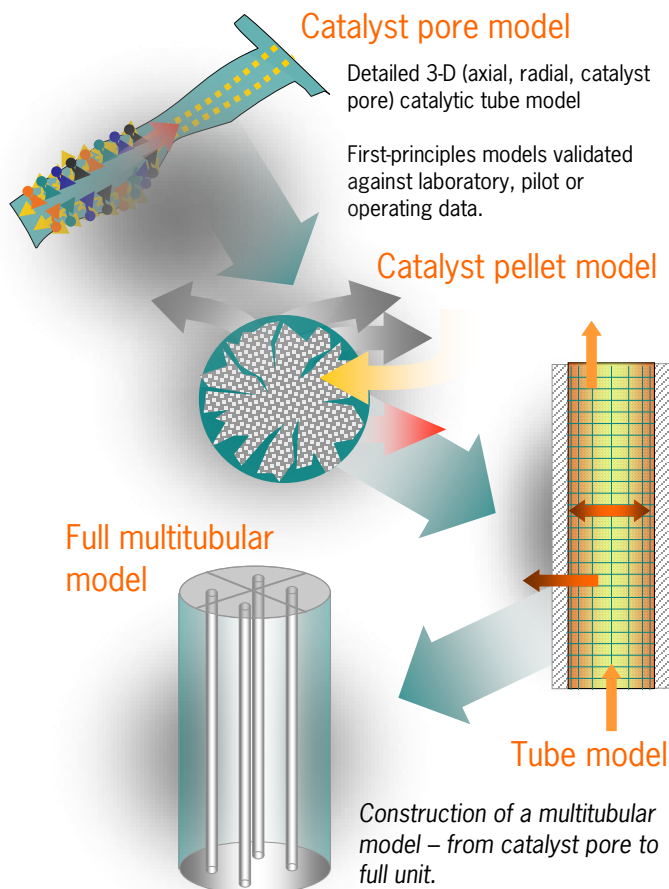
... applied to the full-scale equipment

Why model?

High-accuracy predictive modeling helps you to:

- Design **reactor internals** based on accurate 'near real life' numbers
- Optimise **catalyst design**
- **Reduce pilot plant** and semi-commercial unit testing requirements
- Formally quantify and **manage risk**
- Optimise **operations** and troubleshoot
- Gain **new understanding** of complex processes
- Improve the effectiveness of **R&D experimentation**
- Integrate **experimentation** and **engineering**
- Accelerate **process innovation** at all levels.

PSE supplies **gPROMS modelling technology, advanced process models** and **expert services** around the work. Contact your nearest office for more information.



Accelerate innovation

Manage risk

