UiO : Kjemisk institutt
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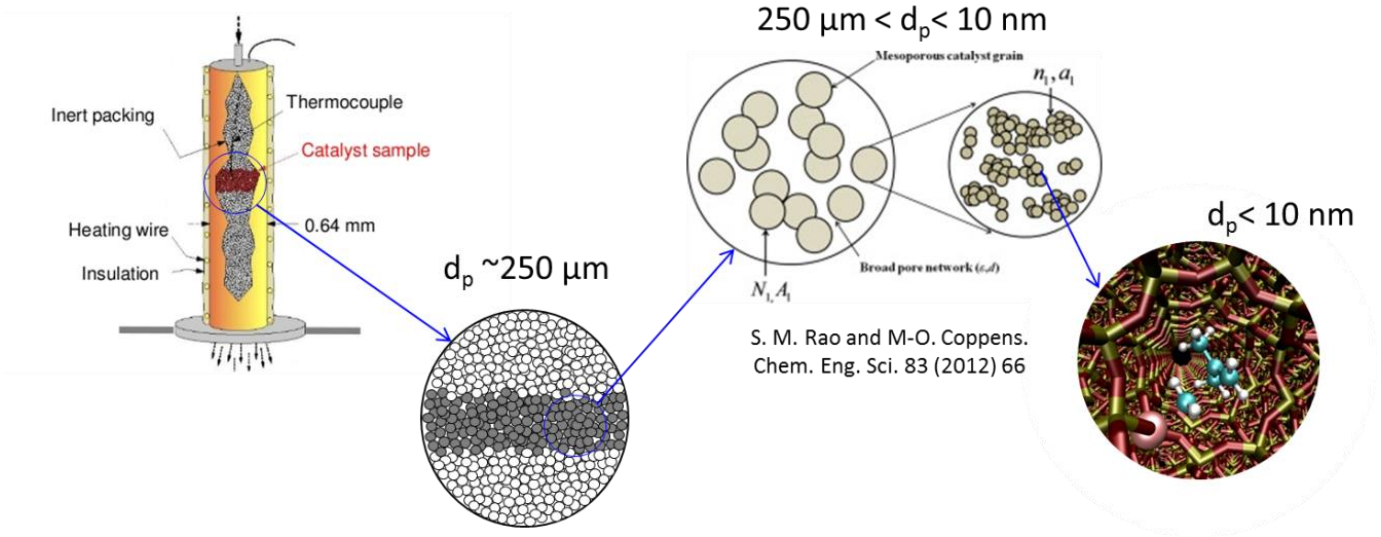
Katalyse

Reaction-diffusion phenomena in time-resolved TAP kinetic experiments



Motivation

Reactive porous materials including zeolites are crucial in catalysis and separation technologies. Understanding the multi-scale reaction/diffusion coupling in these materials is an important requirement for further tuning of their performance. More specifically, this project will investigate the coupling of chemical reactions and diffusion inside nano- and meso-porous materials during Temporal Analysis of Products (TAP) experiments.

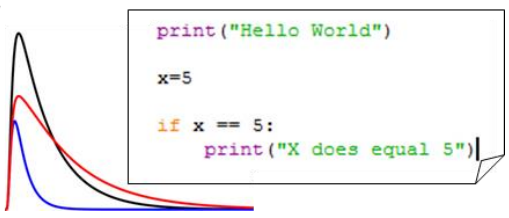
Objectives and scope

- Establish a 1D+1D numerical model of the catalyst bed and pore-scale reaction/diffusion phenomena occurring during pulse-response TAP experiments
- Validate the model with experimental data for a series of well-defined materials

Skills to be developed

- Mathematical modeling of transport phenomena
- Computer programming (Python/C++)
- Collecting experimental TAP data (theory/experiment balance within the project can be adjusted to fit your interests)

$$\frac{\partial C}{\partial t} = D\nabla^2 C + R(C)$$



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