

CH-422

Catalyst design for synthesis

Hu Xile

Cursus	Sem.	Type
Chimiste	MA1, MA3	Opt.

Language of teaching	English
Credits	2
Session	Winter
Semester	Fall
Exam	During the semester
Workload	60h
Weeks	14
Hours	2 weekly
Lecture	2 weekly
Number of positions	

Summary

This course on homogeneous catalysis provide a detailed understanding of how these catalysts work at a mechanistic level and give examples of catalyst design for important reactions (hydrogenation, olefin metathesis, cross-coupling).

Content

- Organometallic chemistry: revision of basic ideas including structure and bonding and the implications this has on reactivity of an organic ligand coordinated to a metal centre.
- A description of the reactions involved in homogeneous catalysis, with an emphasis on the essential features required to predict which type of reactions can take place.
- Hydrogenation
- Olefin metathesis
- Cross-coupling

Keywords

homogeneous catalysis, reaction mechanism, catalyst design, synthesis

Learning Prerequisites**Required courses**

inorganic chemistry
organic chemistry
organometallic chemistry

Recommended courses

homogeneous catalysis

Learning Outcomes

By the end of the course, the student must be able to:

- Classify catalysts and different catalysed reactions
- Explore the molecular mechanisms of catalytic processes
- Assess / Evaluate the ways that catalysts can be improved

- Design superior catalysts (in theory)

Teaching methods

Lecture course

Assessment methods

Written exams; one mid term and one final exam during the semester

Resources

Ressources en bibliothèque

- [Encyclopedia of catalysis / Horváth](#)

Notes/Handbook

Notes in Moodle

Moodle Link

- <https://go.epfl.ch/CH-422>