CH-435

Catalytic asymmetric reactions in organic chemistry

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Cursus	Sem.	Type
Chimiste	MA2, MA4	Opt.

Language of teaching	English
Credits	3
Session	
Semester	Spring
Exam	During the semester
Workload	90h
Weeks	14
Hours	**2 weekly**
Courses	2 weekly
Number of positions	

Summary

This lecture presents the development of catalytic asymmetric reactions in organic chemistry, including important current topics of research in the field.

Content

Principles and Methods of Catalysis:
1. Asymmetric activation of electrophiles with Lewis and Bronsted acids.
2. Asymmetric activation of nucleophiles with metal-and organo-catalysts.
3. Dual activation with acid-base, metal-base, metal-metal and single metal systems.
4. Umpolung of reactivity.

Learning Prerequisites

Recommended courses

General master level knowledge in organic chemistry is highly recommended (including EPFL lectures organic reactions and fonctions I-III, asymmetric synthesis, retrosynthesis, structure and reactivity, or similar lectures in other institutions). Basic knowledge in organometallic chemistry and coordination chemistry is also recommended.

Learning Outcomes

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

- Elaborate on the concepts of catalysis an stereoinduction described in a recent publication
- Formulate in details the following points in a publication: type of reaction, principle of reactivity, catalytic activation and asymmetric induction, full catalytic cycle
- Critique the content of a recent publication in the context of the knowledge in the field

Transversal skills

- Access and evaluate appropriate sources of information.
- Make an oral presentation.
- Summarize an article or a technical report.
- Take feedback (critique) and respond in an appropriate manner.
- Communicate effectively, being understood, including across different languages and cultures.

Teaching methods

ex cathedra presentation with summary and litterature presentations by the students

Expected student activities

active participation to the lecture
presentation of summaries of the course
oral presentation on recent publications in the field

Assessment methods

Written report on the analysis of a recent publication at the end of the semester counting for 80% of the grade
Two oral presentations during the lecture counting for 20% of the grade.

Supervision

Office hours	No
Assistants	No
Forum	Yes

Resources

Virtual desktop infrastructure (VDI)

No

Bibliography

power point presentation without details, need to be completed during lecture (the students will receive the slides in advance). Extensive list of primary articles as bibliographical support given during the lecture