

CH-432

Structure and reactivity

Cramer Nicolai

Cursus	Sem.	Type
Chemistry and Chemical Engineering		Opt.
Chimiste	MA1, MA3	Opt.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	Oral
Workload	90h
Weeks	14
Hours	2 weekly
Courses	2 weekly
Number of positions	

Summary

To develop a detailed knowledge of the key steps of advanced modern organic synthesis going beyond classical chemistry of olefins and carbonyls.

Content**1. Repetition of the chemistry of olefins and carbonyls**

- limitations

2. Rearrangements

- Sigmatropic: Claisen, Ireland-Claisen, Johnson-Claisen, Eschenmoser, Wittig, Evans-Mislow
 - Reactive intermediates : cations, carbenes, nitrenes

3. Cyclisations and Cycloadditions

- Pericyclic reactions
 - Diels-Alder (normal, hetero, inverse electron demand)
 - Dipolar cycloadditions

4. Radical- and Photochemistry**5. Strategy of Umpolung**

- Stoichiometric and catalytic

6. Metal-catalysis in Organic Chemistry

- Cross-coupling and metathesis
 - Olefins and C-H bonds functionalization
 - Synthesis of carbo- and heterocyclic systems

Learning Outcomes

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

- Develop a detailed knowledge of the key steps of advanced modern organic synthesis going beyond classical chemistry of olefins and carbonyls

Transversal skills

- Assess one's own level of skill acquisition, and plan their on-going learning goals.
- Demonstrate the capacity for critical thinking

Teaching methods

ex cathedra lecture

Assessment methods

final oral exam

Resources

Websites

- http://scgc.epfl.ch/telechargement_cours_chimie

Moodle Link

- <https://go.epfl.ch/CH-432>