CH-424

Supramolecular chemistry

Severin Kay

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

The course provides an introduction to supramolecular chemistry. In addition, current trends are discussed using recent publications in this area.

Content

- Introduction
- Basics
- Receptors for cations
- Receptors for anions
- Receptors for neural molecules
- Supramolecular coordination chemistry
- Catenanes, rotaxanes and knots
- Molecular machines
- Supramolecular catalysis
- Self-replicating molecules
- Molecular imprinting
- Dynamic combinatorial libraries
- Foldamers

Learning Outcomes

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

- Recall the most important non-covalent interactions.
- Recall analytical techniques for the analysis of host-guest systems.
- Assess / Evaluate the thermodynamic driving force for the formation of self-assembled systems.
- Recall the most important classes of receptors for anions, cations, and neutral molecules.
- Recall the design principles for the construction of metallasupramolecular aggregates.
- Differentiate rotaxanes, pseudorotaxanes, catenenaes and molecular knots and machines, and recall synthetic routes to make these compounds
- Recall attempts for the bottom-up construction of molecular machines.
- Describe the basic concepts of self-replicating molecules, molecular imprinting, foldamers, and selection experiments with dynamic combinatorial libraries.

Expected student activities

Summarize and discuss a recently published research article in the area of supramolecular chemistry in form of a Powerpoint presentation.

Assessment methods

Written exam during the course (50%)
Oral presentation during the course (50%)

Resources

Ressources en bibliothèque

- Principles and Methods in Supramolecular Chemistry / Schneider
- Supramolecular Chemistry / Steed

Websites

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