Code: QO853

Name: Introdução à Química Supramolecular e Catálise Supramolecular

Name in English: Introduction to Supramolecular Chemistry and Supramolecular Catalysis

Name in Spanish: Introducción a la Química y Catálisis Supramolecular

Subject type: weekly

Approval Type: grade and presence

Characteristic: Regular

Frequency: 75%

Period Type / Offering period: every six months/all periods

Requires Final Exam: yes

Vectors

T	L	P	O	PE	OE	SL	WEEKS	CREDITS
2	**-**	**-**	**-**	**-**	**-**	**2**	**15**	**2**

Occurrence on curriculum:

Pre requirement: QO321 + QO521

Summary: Basic concepts of Supramolecular Chemistry. Self-assembly, self-sorting and self-organization. Synthesis of supramolecular building blocks. Introduction to Supramolecular Catalysis focusing on usual organic chemistry reactions (hydrolysis, aldol reactions, Diels-Alder reaction and others).

Program:

1. Understanding the concept of "Chemistry beyond the molecule" and the paramount importance of noncovalent interactions in supramolecular structures. Van der Walls interactions, hydrogen bonding, aromatic interactions$\pi-\pi$, interactions$\pi-$cations. Donor-acceptor interactions, metal-ligand, dynamic covalent bonds.
2. Self-assembly, self-sorting and self-organization.
3. Entropy and supra-structures:Hydrophobic effect, pre-organization, flexibility, multiple recognizement.
4. Supramolecular building blocks: crown ethers, cyclodextrins, calixarenes, metaloporphyrines, cucubituriles, oligopyridines and others.
5. Supramolecular nanoreactors and organic reactions: Diels-Alder cycloaddition, aldol reactions, hydrolysis, terpene cyclization and photo oxidations.

Basic Bibliography

1) STEED, J. W.; ATWOOD, J. L. **Supramolecular Chemistry**. 2 nd Ed. UK: Wiley, 2009. 875p.
2) BRINKER, U. H.; MIEUSSET, J. L. **Molecular Encapsulation – Organic Reactions in Constrained Systems.** 1 st Ed. UK: Wiley, 2010. 597p.
3) SCHNEIDER, H. J. **Applications of Supramolecular Chemistry.** 1 st Ed. UK: CRC Press, 2016. 454p.

Supplementary Bibliography

1) CRAGG, P. J. **Supramolecular Chemistry: From Biological Inspiration to Biomedical Applications.** 1 st Ed. Netherlands: Springer, 2010. 260p.
2) STEED, J. W.; TURNER, D. R.; WALLACE, K. J. **Core Concepts in Supramolecular Chemistry and Nanochemistry.** 1 st Ed. UK: Wiley, 2007. 320p.
3) ARIGA, K; KUNITAKE, T. **Supramolecular Chemistry - Fundamentals and Applications - Advanced Textbook.** 1 st Ed. Berlin Heidelberg: Springer, 2006. 208p.
4) DODZIUK, H. **Introduction to Supramolecular Chemistry**. 1 st Ed. Netherlands: Springer, 2007. 350p.
5) SCHALLEY, C. A. **Analytical Methods in Supramolecular Chemistry**. 1 st Ed. UK: Wiley, 2012. 844p.