Sustainable chemistry

ECTS credits
4 credits

In brief

Course langage: English

Presentation

Learning objectives

Sustainable chemistry concerns the material transformation process industry. This module brings the essential bases of chemistry and green processes, and allows to understand the possibilities of recycling and industrial symbiosis, which are presented in the EU "Circular Economy". It is thus about discovering and appropriating methods based on the development of innovative and clean associated chemical technologies, focused on the will to implement clean processes (less polluting and/or less consuming raw materials or energy), but also on the use of bio-based materials. Sustainable chemistry is underpinned by the European chemical regulation, REACH, and the concepts or principles based on eco-design and the circular economy are of course directly related to sustainable chemistry.

Description of the programme

The EU program addresses sustainability aspects, the 12 principles of green chemistry, homogeneous and heterogeneous phase catalysis, biocatalysis, new reaction media, renewable feedstocks, as well as new concepts guiding research and development in this field (such as bio mimicry).
More specifically, the EU is structured around the following topics:
- introduction to green chemistry, towards a bio-based economy?
- health and environmental safety: REACH, new European chemical regulations - agro resources
- reduction of material quantities. Alternative solvents
- catalysis (organocatalysis / biocatalysis / homogeneous catalysis)
- practical work
- green processes: cells seen as living factories, intensification and energy saving

Generic central skills and knowledge targeted in the discipline

- C1: Scientific and technical innovation
- Development of new, more economical and/or more efficient processes, based on a thorough knowledge of the basic principles
- C2: Control of complexity and systems
- Better management of the production chain, use of resources, waste treatment, circular economy

How knowledge is tested

- Green Chemistry: assessment, 25
- Green Chemistry : continuous assessment, 25
- Green chemistry: practical work, 30
- Green processes: continuous assessment, 20

Bibliography

– S. Antoniotti, Chimie vert Chimie durable, Ellipses Marketing (2013)
– J. Augé et M.-C. Scherrmann, Chimie verte : Concepts et applications, EDP Sciences/CNRS (2016)

Teaching team

- D. Hérault
- D. Nuel
- P. Guichardon
- A. Soric
- External speakers

Sustainable Development Goal



Clean water and sanitation



Affordable and clean energy



Building Resilient Infrastructure



Sustainable cities and communities

Total des heures		**42h**
CM	Master class	28h
TD	Directed work	6h
TP	Practical work	8h

Useful info

Name responsible for EU

Lead Instructor
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