



PROGRAMS AND BIBLIOGRAPHY

Subject	
Code	Name
QO857	Introduction to Green Chemistry

Vector
OF:S-6 T:002 P:000 L:000 O:000 D:000 HS:002 SL:002 C:002 AV:N EX:S FM:75%

Pre requirement	AA450
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Summary
Sustainability. History of Green Chemistry. Principles and Metrics. Renewable Raw Materials. Green Solvents. Notions of Catalysis. Prevention of Waste and Reduction of Risks. Examples of the application of Green Chemistry.

Program
<ol style="list-style-type: none">1. Sustainability2. Historical Introduction and Definition of Green Chemistry3. The Twelve Principles of Green Chemistry:<ol style="list-style-type: none">3.1. Prevention;3.2. Atomic Efficiency;3.3. Safer Synthesis;3.4. Development of safer products;3.5. Use of safer solvents and auxiliaries;3.6. Search for energy efficiency;3.7. Use of raw materials obtained from renewable sources;3.8. Avoid the formation of derivatives;3.9. Catalysis;3.10. Degradable products;3.11. Real-time analysis for pollution prevention;3.12. Safe chemical for the prevention of accidents.4. Metrics and life cycle analysis

5. Examples of sustainable/green chemistry / technology that have been developed covering the areas of Chemistry including Organic Chemistry, Inorganic Chemistry, Analytical Chemistry, Industrial Chemistry, Polymer Chemistry, Environmental Chemistry and Biochemistry.

Bibliography

- [1] Anastas, P.T., Warner, J.C., Green Chemistry: Theory and Practice, Oxford University Press, New York, 1998.
- [2] Lancaster, M., Green Chemistry: an introductory text, Cambridge, Royal Society of Chemistry, 2002
- [3] Kirchhoff, M.M., Promoting sustainability through green chemistry. Resources, Conservation and Recycling, 44, 237, 2005.
- [4] Corrêa, A.G., Zuin, V.G. (organizadoras), Química Verde: Fundamentos e Aplicações, São Carlos; Ed. da UFSCar, 2009.
- [5] Silva, F.M.; Lacerda, P.S.B., Jones Jr., J. Desenvolvimento sustentável e Química Verde. Química Nova, 28, 103, 2005.
- [6] Lenardão, E.J., Freitag, R.A., Dabdoub, M.J., Batista, A.C.F., Silveira, C.C., "Green Chemistry" – Os 12 princípios da Química Verde e sua inserção nas atividades de ensino e pesquisa, Química Nova, 26, 123, 2003.
- [7] Erin M. Gross, E. M., Green Chemistry and Sustainability: An Undergraduate Course for Science and Nonscience Majors, J. Chem. Educ., 90, 429, 2013.

Evaluation criteria

For grading policy, see: Regimento Geral de Graduação, Seção I – Normas Gerais, Capítulo V – Da Avaliação do Aluno na Disciplina. Students are required to attend 75 % of the lectures. For further details, see: Regimento Geral de Graduação, capítulo VI, seção X, artigo 72.