

SÚMULA DA DISCIPLINA

1. Identificação

Nome disciplina: QUP 148 – Nuclear Magnetic Resonance applied to polymers

Professor responsável: Griselda Galland Barrera

Nível: Mestrado e Doutorado

Carga horária: 30

Créditos: 2

Revisado e atualizado em: Junho_2020

2. Ementa

¹H and ¹³C Nuclear Magnetic Resonance applied to polymers in general and specially to polyolefins

3. Objetivo

Present the basic concepts about ¹H and ¹³C Nuclear Magnetic Resonance applied to polymers

4. Conteúdo Programático

- Basic principles of NMR spectroscopy
- Characterization of polymers by ¹H NMR
- Characterization of polymers by ¹³C NMR
- Quantitative analysis
- Optimization of instrumental parameters
- Vinyl polymers. Inversions. Tacticity
- Study of polymerization mechanisms. Statistical models
- Copolymers analysis. Calculation of the comonomer contents and the reactivity ratios
- Determination of terminal groups. Calculation of molecular weights.

5. Avaliação

The course consists in eight presentations in video, after each one the student will receive a quiz and exercises to answer. The grades obtained in these eight evaluations will represent 40% of the final mark. The student will have to make a video explaining a paper in the area, previously approved by the professor. This video will represent 20% of the final mark. Finally, the students will receive a final test with problems to resolve. This test will have a weight of 40 % in the final grade. If a student does not attend 60% of approval in the three evaluations (8 quiz, video and test) he can have the opportunity to make a recuperation test, and the final mark will be the grade of this test.

Grades:

A: approved (excellent) 90-100%

B: approved (good) 75 -89%

C: approved (average) 60-74%

D: disapproved below 60%

FF: disapproved (participation inferior to 75%)

6. Método de Trabalho/Ensino

Moodle (online)

7. Bibliografia

- J. Keeler, Understanding NMR Spectroscopy, Ed. Wiley, 2005.
- T. D. W. Claridge, High-Resolution NMR Techniques in Organic Chemistry, Tetrahedron Organic Chemistry, 27, Ed. Elsevier, 2009.
- M. Balci, Basic ^1H - ^{13}C -NMR Spectroscopy, Elsevier, Amsterdam, 2005.
- M. Levitt, Spin Dynamics: Basics of Nuclear Magnetic Resonance, Wiley, 2nd Ed., 2008.
- S. Braun, H. O. Kalinowski e S. Berger, 150 and More Basic NMR Experiments Wiley VCH.
- T. D. W. Claridge, High-Resolution NMR Techniques in Organic Chemistry, Tetrahedron Organic Chemistry, 27, Ed. Elsevier, 2009.
- R. M. Silverstein, G. C. Bassler e T. C. Morrill, Identificação Espectrométrica de Compostos Orgânicos, 7ª Ed. LCT, 2010.
- D. Pavia, G. Lampman, G. Kriz e J. Vyvyan, Introduction to Spectroscopy. 2ª Ed. Cengage Learning, 2015.