Code: **QF053**

Name: **Laboratório de Química Aplicada**

Name in English: **Applied Chemistry Laboratory**

Name in Spanish: **Laboratorio de Química Aplicada**

Subject type: **Weekly**

Approval Type: **Grade and Attendance**

Characteristic: **Regular**

Frequency: **75%**

Period Type / Offering period: **Semester / All periods**

Requires Final Exam: **Yes**

Vectors

T	L	P	O	PE	OE	SL	WEEKS	CREDITS
-	**4**	**-**	**-**	**-**	**-**	**4**	**15**	**4**

Occurrence on curriculum: **05, 50**

Pre requirement: *** QF661**

Summary: **Experiments in applied chemistry related to material properties, colloid properties, surface physical chemistry, and industrial relevance systems and processes.**

Programa:

Processing operations. Developed through experiments such as: Alcohol gel preparation; Distillation; Polymer processing. Material properties. Developed through experiments such as: Polymer identification; Thermal properties of polymers; Mechanical properties of polymers; Polymer crystallization. Colloid properties. Developed through experiments such as: Adsorption isotherms; Viscosity of polymeric solutions; Rheology; colloidal stability. Surface physical chemistry. Developed through experiments such as: Surface tension determination; Emulsion stability; contact angle measurements and surface modification.

Basic Bibliography

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2) SHAW, D.J. **Introdução à Química de Coloides e de Superfícies**. São Paulo: Editora da Universidade de São Paulo, 1975. 195 p
3) ATKINS P. de PAULA, J. **Atkins físico-química**. 9. Ed. Rio de Janeiro: LTC, 2012. 416 p

Supplementary Bibliography

1) ADAMSON, W. GAST, A.P. **Physical Chemistry of Surfaces**, 6. Ed. New York: Wiley Interscience Pub., 1997. 808 p
2) NETZ, P.A., ORTEHA, G.G. **Fundamentos de Físico-Química**, São Paulo: Arimed Editora S.A., 2002. 296 p
3) ALBERTY, R.A. **Physical Chemistry**, Singapore: John Wiley & Sons, 1987.
4) VOGEL, A. I. **Química Orgânica,** Rio de Janeiro: Ao Livro Técnico S/A, 1985. Vol. 1
5) LOVELL, P.A. In. ALLEN, G.; BEVINGTON, J., eds. **Comprehensive Polymer Science.** 7. Ed. Oxford: Pergamon Press, 1989. vol. 1 Polymer Characterization, cap. 9.
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7) MANDELKERN, L. **Cristallization and melting**, In. ALLEN, G.; BEVINGTON, J., eds. **Comprehensive Polymer Science.** Oxford: Pergamon Press, 1989. vol. 2 Polymer Properties, pg. 363.
8) **Tensile Testing of Plastics and Polymers from Intertek. Visão geral da máquina de ensaios mecânicos e dos parâmetros que podem ser medidos em polímeros.** Vídeo (2:46 min): https://www.youtube.com/watch?v=VgE7TaXuUqI
9) **Materials Concepts. Definições dos principais parâmetros extraídos dos ensaios mecânicos.** Vídeo (9:03 min): https://www.youtube.com/watch?v=_b6UIsANNl0

10) University of Cambridge. Site com curva interativa: https://www.doitpoms.ac.uk/tlplib/polymers/stress-strain.php
11) University of Cambridge. **Efeito da velocidade de estiramento.** Site com pequenos vídeos: https://www.doitpoms.ac.uk/tlplib/polymers/tensile-testing.php
12) **OMNEXUS-The material selection platform. Cálculo do módulo de Young e valores de referência para polímeros.** https://omnexus.specialchem.com/polymer-properties/properties/young-modulus
13) PAVIA et al, **Introduction to Laboratory Techniques: Small scale approach**, 1º ed., Orlando: Harcourt College Publisher,1998. págs 733-746.
14) TREYBAL, R.E. **Mass Transfer Operations,** Boston: McGraw-Hill, 1981.
15) CARVALHO, M. A. P., CURTIS, W. R., **Pilot Plant Batch Distillation**, I. Wilson, I.D. Encyclopedia of Separation Science, 2000. p. 1098-1113 (https://doi.org/10.1016/B0-12-226770-2/04741-4)
16) McCABE, W.L., SMITH, J.C, HARRIOTT, P. **Unit Operations of Chemical Engineering**, 7. Ed. Boston: McGraw Hill, 2005