Code: QA583

Name: Preparo de Amostras

Name in English: Sample Preparation

Name in Spanish: Preparación de Muestras

Subject type: Weekly

Approval Type: Grade and frequency

Characteristic: Regular

Frequency: 75%

Period Type / Offering period: Semi-annual / Every period

Requires Final Exam: Yes

Vectors

T	L	P	O	PE	OE	SL	WEEKS	CREDITS
2	**0**	**0**	**0**	**0**	**0**	**2**	**15**	**2**

Occurrence on curriculum: 05, 50

Pre requirement: QA381 + QA383 + QA481 + QA483

Summary:
Fundamentals of sample preparation techniques for organic and inorganic analytes.

Program:
The analytical sequence. Sources of errors in sample preparation. Fundamentals of sample preparation techniques for inorganic analytes determination. Decomposition techniques: dry chemical decomposition, Schoniger flask test, fusion, combustion tube, Fenton, Kjeldahl and Carius methods. Decomposition using high pressure: decomposition pumps, high-pressure incinerators, application of microwave radiation for decomposition/extraction. Application and discussion of auxiliary sources for sample conservation and preparation: lyophilization, ultrasound and laser. Fundamentals of sample preparation techniques for organic analytes determination. Phase transference processes: partition, adsorption and volatilization. Classification of sample preparation techniques for organic analytes. Liquid-liquid extraction. Solid-liquid extraction (Soxhlet; extraction with pressurized fluids; extraction with superheated water and with supercritical fluids; ultrasound-assisted extraction and microwave-assisted extraction; QuEChERS). Microextraction and correlated techniques. Headspace techniques.

Basic Bibliography

1) SKOOG, D.A.; WEST, D.M.; HOLLER, F.J.; CROUCH, S.R. **Fundamentos de Química Analítica**. tradução da 9. Ed. São Paulo: Cengage Learning, 2015. 950 p.
2) FIGUEIREDO, E.C.; BORGES, K.B.; QUEIROZ, M.E.C. **Preparo de Amostras para Análise de Compostos Orgânicos**. Rio de Janeiro: LTC-GEN, 2015. 263 p.
3) ARRUDA, M.A.Z. **Trends in Sample Preparation**. 1. Ed. New York: Nova Science, 2007. 304 p.

Supplementary Bibliography

1) PAWLISZYN, J. **Comprehensive sampling and sample preparation ANALYTICAL TECHNIQUES FOR SCIENTISTS**. Amsterdam: Elsevier/Academic Press, 2012. E-book
2) PAWLISZYN, J.; LORD, H. **Handbook of Sample Preparation**. Hoboken: Wiley-Blackwell, 2010. E-book.
3) MITRA, S. **Sample Preparation Techniques in Analytical Chemistry**. Hoboken: Wiley, 2003. 464 p.
4) FLORES, E.M.M. **Microwave-assisted sample preparation for trace element analysis**. 1. Ed. Amsterdam: Elsevier, 2014. 400 p. E-book.
5) GÜNZLER, H.; WILLIAMS, A. **Handbook of analytical techniques**. New York: Wiley-VCH, 2001. E-book. 1182 p.