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| Study program: Integrated academic studies of Pharmacy | | | |
| Type and level of the study program: integrated academic studies | | | |
| Course title: Preparative analytical chemistry in pharmacy (PhIII-PACH) | | | |
| Teacher: Nataša B. Milić, Nataša P. Milošević, Maja Lj. Milanović, Mira P. Mikulić | | | |
| Course status: elective | | | |
| ECTS Credits: 3 | | | |
| Condition: Organic Chemistry 2; Analytical Chemistry 2; Instrumental Pharmaceutical Analysis | | | |
| Course aim The aim of this course is to introduce students with preparatory analytical methods and give them the knowledge necessary to select the best method to prepare samples for analysis. | | | |
| Expected outcome of the course: Mastering the theoretical aspects of analytical methods for sample preparation, introduction to the basic principles of instruments used in preparative chemistry analysis and their advantages and disadvantages. Knowledge of various preparative and analytical methods for selection of the most appropriate methods for sample preparation. | | | |
| Course description | | | |
| <i>Theoretical education</i> | | 20. Membrane extraction. | |
| 1. Errors in the quantitative analysis. The accuracy and precision. | | 21. Preparation of samples for analysis of metals. | |
| 2. Sample preparation. Sample storage. | | 22. Wet digestion. | |
| 3. Quality control in the process of sample preparation. | | 23. Dry ashing method. | |
| 4. Extraction and preconcentration of the diluted sample. | | 24. Preparation of water samples. | |
| 5. Principles of extraction and the extraction of semi-volatile organic compounds from liquid samples. | | 25. Methods of precipitation. | |
| 6. Liquid-liquid extraction. Liquid-solid extraction. | | 26. Preparation of sediment for direct atomic absorption spectroscopy. | |
| 7. Solid phase extraction-SPE. | | 27. Colorimetric methods. | |
| 8. Solid phase microextraction. | | 28. Contamination of the sample during the analysis of metals. | |
| 9. Stir bar sorptive extraction - SBSE. | | <i>Practical education: exercises, other forms of education, research related activities</i> | |
| 10. Principles of extraction and the extraction of semi-volatile organic compounds from solid samples. | | Selected examples of theoretical and experimental exercises: | |
| 11. Soxhlet extraction. | | 1. Theoretical comparison of extraction methods of semi-volatile organic compounds from liquid samples. | |
| 12. Ultrasonic extraction. | | 2. Theoretical comparison of extraction methods of semi-volatile organic compounds from solid samples. | |
| 13. Supercritical fluid extraction. | | 3. Theoretical comparison of methods for extraction of volatile organic compounds from solid and liquid samples. | |
| 14. Microwave extraction. | | 4. Theoretical comparison of methods of sample preparations for analysis of metals. | |
| 15. Extraction with high pressure and temperature (Accelerated Solvent Extraction -ASE) | | 5. Selected experimental exercises of the extraction method for semi-volatile organic compounds from liquid samples. | |
| 16. Extraction of volatile organic compounds from solid and liquid samples. | | 6. Selected experimental exercises of the extraction method for semi-volatile organic compounds from solid samples. | |
| 17. Static headspace extraction. | | 7. Selected experimental exercises of the extraction method for volatile organic compounds from solid and liquid samples. | |
| 18. Dynamic headspace extraction of purge and trap. | | 8. Selected experimental exercises of the sample preparation method for the analysis of metals. | |
| 19. Liquid-liquid extraction of large volume. | | | |
| Literature | | | |
| <i>Compulsory</i> | | | |
| 1. Somenath M. Sample preparation techniques in analytical chemistry. John Wiley & sons, Inc, Publication Hoboken, New Jersey, 2003, | | | |
| <i>Additional</i> | | | |
| 1. Internal script for practical education. | | | |
| Number of active classes | | | Other: |
| Lectures: 30 | Practice: 15 | Other types of teaching: | Research related activities: |
| Teaching methods: lectures, interactive classes, experiments, demonstrations | | | |
| Student activity assessment (maximally 100 points) | | | |
| Pre-exam activities | points | Final exam | points |
| Lectures | 5 | Written | 50 |
| Practices | 20 | Oral | |
| Colloquium | | | |
| Essay | 25 | | |