Universidad Zaragoza

Academic Year/course: 2023/24

27201 - Introduction to The Chemistry Laboratory

Syllabus Information

Academic year: 2023/24
Subject: 27201 - Introduction to The Chemistry Laboratory
Faculty / School: 100 - Facultad de Ciencias
Degree: 452 - Degree in Chemistry
ECTS: 9.0
Year: 1
Semester: Annual
Subject type: Basic Education
Module:

1. General information

The subject and its expected results respond to the following approaches and objectives:

- To provide the student with a practical vision of chemistry.
- To enable the student to perform in a safe and solvent way in the chemical laboratory.
- To provide a practical experience to support the proper understanding of the basic concepts of chemistry

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/es/):

- Goal 4: Quality Education.
- Goal 8: Decent Work and Economic Growth
- Goal 12: Responsible Production and Consumption
- Goal 13: Climate Action

2. Learning results

The learning results of this subject are perfectly linked and complemented with those of the subject General Chemistry

- Develops the experimental work demonstrating knowledge of the fundamental rules of safety and work in a chemical laboratory
- Knows and uses correctly, accurately and safely the instruments and the basic reagents of a chemical laboratory. Prepares solutions and uses the appropriate units of concentration.
- Carries out chemical reactions in the laboratory, demonstrating knowledge of the principles and balance that guide them.
- Determines some physical or chemical properties in simple chemical systems.
- Knows and uses the basic techniques for separation, purification and determination of chemical compounds.
- Relates the principles of chemistry with the experimental facts and these with the theory and scientific method, in general, and especially in chemistry.

3. Syllabus

1. Safety basic work in the laboratory.
2. Concentration of solutions. Strong and weak electrolytes.
3. Equilibria in solution. Indicators. Acid-base reactions.
4. Obtaining and properties ofCO2 and H2 and determination of the atomic weight of a metal.
5. Electron transfer reactions.
6. Study of the most characteristic properties of groups 1, 2 and 17.
7. Study of the physical properties of some compounds. Determination of the molecular weight of a volatile liquid.
8. Neutralization heat.
9. Cryoscopy.
10. Reaction kinetics.

11-13. Qualitative analysis: identification of cations and anions.

14. Liquid-liquid extraction.
15. Recrystallization.
16- Simple distillation.

17- Thin layer chromatography.

18-20. Practices with everyday products.

4. Academic activities

Activity 1: Acquisition of basic knowledge of chemical laboratory work (1 ECTS). Methodology: Master classes.

Activity 2: Problem solving and case study analysis in small groups (1 ECTS). Methodology: Problem- and case-based learning.

Activity 3: Preparation and performance of laboratory practices (6 ECTS). Methodology: Comparative study individual preparatory material and execution of the laboratory practice.

Activity 4: Supervised experimental work based on applied cases of properties or chemical products of common use (1 ECTS). Methodology: Statement and discussion of an applied problem, and execution of the practice in the laboratory.

5. Assessment system

This subject has a special practical dimension so, exceptionally, the first call will be evaluated only by continuous evaluation.

The following aspects will be evaluated at the first call:

- Realization and evaluation of pre- and final questionnaires. Reports of practices 1-17. Grades of the continuous evaluation of quizzes and seminar problems. 40% of the final grade.
- Performance and skill demonstrated in the laboratory. Lab notebook grading based on data collection, results, warnings, notes, etc. 15 % of the final grade.
- Material prepared in groups of two students for practices 18-20 and its public exhibition. Final questionnaires and reports of such practices. Qualification of the course "Basic digital competence in the degree in Chemistry" given by the staff of the Library of the University of Zaragoza. 8 % of the final grade.
- Theoretical-practical final exam, compulsory for all students, related to the practices performed. 37 % of the final grade.

The evaluation of the second call will consist of a global theoretical-practical test related to the contents of the subject.