COURSE GUIDE 2023/24

Faculty 215 - Faculty of Chemistry **Cycle** .

Degree GQUIMI20 - Bachelor's Degree in Chemistry **Year** Second year

COURSE

26125 - Experimental Inorganic Chemistry **Credits, ECTS:** 6

COURSE DESCRIPTION

This course includes a set of practices with which it is intended that the student obtains a broad vision of the methods of synthesis in inorganic chemistry, becomes familiar with the working material and obtains conclusions that can be projected in new preparations.

COMPETENCIES/LEARNING RESULTS FOR THE SUBJECT

The objective of these demonstration is for the student to get familiarized with a range of synthesis methods in inorganic chemistry, with inorganic chemistry labware and the student should be able to plan new preparations.

In this subject the student will develop basic competences defined in RD 1393/2007 for this level in Chemistry. He/she will also develop general competences M2.T1, M2.T2, M2.T3 and M2.T4 of the fundamental module. At the same time he/she will evolve specific competences in inorganic chemistry, such as, the safe manipulation of chemicals and inorganic compounds bearing in mind their properties and specific risks, planning and carrying out simple synthesis using the appropriate methods. Also, the student should be able to apply the knowledge acquired about the properties, methods of obtainment of the most representative compounds, and apply simple methods of characterization to those inorganic compounds. In this way this subject will contribute to the development of M2.12 and M2.13 competences.

The vertical and horizontal coordination competence of the subject in the Module and in the Grade lies on the Grade Coordination Commission.

CONTENIDOS TEÓRICO-PRÁCTICOS

Introduction to safety in the laboratory. Commonly used toxic and dangerous substances. The laboratory book.
Experiments at the microscale. Basic procedures.
Reactivity of s and p block elements. Acid-base character. Redox properties. Solubility. Stability and characteristic reactions of the most common elements and simple compounds.
Characteristic reactions of transition metals. Reactions in water solution. Study of the predominant species depending on the pH. Oxoanion formation. Solubility and formation and stability of complexes.
Obtainment of elements and simple coordination compounds: obtainment of metals starting from their oxides. Obtainment of compounds of industrial interest. Preparation of simple coordination compounds.
Identification and characterization of simple inorganic salts: flame test, solubility in different media, pH, reaction with acids, etc.

TEACHING METHODS

7 Seminars with information necessary for the realization of the internships.
20 three-hour practical sessions.
In the sessions they will perform:
Reactivity tests in test tubes
Synthesis of double salts
Synthesis of complex salts

TYPES OF TEACHING

Types of teaching	M	S	GA	GL	GO	GCL	TA	TI	GCA
Hours of face-to-face teaching		12		48					
Horas de Actividad No Presencial del Alumno/a		40		50					

Legend: M: Lecture-based S: Seminar GA: Applied classroom-based groups
GL: Applied laboratory-based groups GO: Applied computer-based groups GCL: Applied clinical-based groups
TA: Workshop TI: Industrial workshop GCA: Applied fieldwork groups

Evaluation methods

- End-of-course evaluation

Evaluation tools and percentages of final mark

- Written test, open questions 30%

- Exercises, cases or problem sets 70%

ORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

-Attendance is compulsory
Final mark consists of:
a)Written exam. (30%)
b)Carrying out the demonstrations (exercises, problems, lab notebook...) (70%). By the middle of the practical lessons, students will have to pass a written test about basic and essential concepts related with (inorganic) chemistry in order to pass the subject.
a) and b) need to be passed separately.

The criteria for eligibility for the final evaluation are those laid down in Chapter 2, Article 8 of the Normative regulation of the evaluation of the students of the EHU degrees. The criteria for waiving the continuous call are those set out in Chapter 2, article 12 of the regulation of the evaluation of the students of EHU degrees.
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EXTRAORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

a)Written exam. (30%)
b)Carrying out the demonstrations (exercises, problems, lab notebook...) (70%)
a) and b) need to be passed separately.

MANDATORY MATERIALS

-Labcoat.
-Safety googles.
-Lab globes.
-Spatula.
-Demonstations' guide.
-pH measuring strips

BIBLIOGRAFÍA

Basic bibliography

-J. Alcañiz, Manual de sintesis de compuestos inorgánicos en laboratorio. Publicaciones de la Universidad de Alicante (2007).
-Z. Szafran, R. M. Pike, M. M. Singh. Microscale Inorganic Chemistry: A Comprensive Laboratory Experience. Wiley & Sons, New York (1991).

Detailed bibliography

- D.M. Adams, Sólidos inorgánicos. Editorial Alhambra, Madrid (1986).
- D. Astruc, Química Organometálica. Reverté, Barcelona (2003).
- P. Atkins, T. Overton, J. Rourke, M. Weller y F. Armstrong. Shriver & Atkins: Química Inorgánica. 4ª ed., Mc Graw-Hill, México (2008).
- F.A. Cotton, G. Wilkinson, C.A. Murillo y M. Bochmann, Advanced Inorganic Chemistry. 6ª ed., Wiley & Sons, New York (1999). Traducción de la 4ª ed. en Castellano, Limusa-Wiley, México (1986).
- G.S. Girolami, T.B. Rauchfuss, R.J. Angelici, Synthesis and Tecnique in Inorganic Chemistry. 3ª Ed., University Science Books (1999).
- N.N. Greenwood y A. Earnshaw, The Chemistry of the Elements. 2ª ed., Butterworth Heinemann, Oxford (1997).
- J.E. Huheey, E.A. Keiter, R.L. Keiter, Inorganic Chemistry: Principles of Structure and Reactivity. 4ª ed., Harper Collins Publishers, New York (1997).
- J. Ribas Gispert, Coordination Chemistry. Verlag Chemie, Weinheim (2008).
- Z. Szafran, R. M. Pike, M. M. Singh. Microscale Inorganic Chemistry: A Comprensive Laboratory Experience. Wiley & Sons, New York,1991.
- J. Tanaka y S.L. Suib, Experimental Methods in Inorganic Chemistry. Prentice Hall (1999).
- A.R. West, Solid State Chemistry and its Applications. Wiley (1990).
- J.D. Woollins, Inorganic experiments. 2ª ed., VCH Publishers: Nueva York (2003).

Journals

In each course it will be indicated in the teaching guide.

Web sites of interest

In each course it will be indicated in the teaching guide.

OBSERVATIONS