

COURSE GUIDE

2021/22

Faculty 215 - Faculty of Chemistry

Cycle Not Applicable

Degree GQUIMI20 - Bachelor's Degree in Chemistry

Year Second year

COURSE

26125 - Experimental Inorganic Chemistry

Credits, ECTS: 6

COURSE DESCRIPTION

Esta asignatura engloba un conjunto de prácticas con las que se pretende que el/la alumno/a obtenga una amplia visión de los métodos de síntesis en química inorgánica, se familiarice con el material de trabajo y obtenga conclusiones que pueda proyectar en nuevas preparaciones.

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 Seminarios con información necesaria para la realización de las prácticas.

20 sesiones prácticas de tres horas.

En las sesiones realizarán:

Pruebas de reactividad en tubo de ensayo

Síntesis de sales dobles

Síntesis de sales complejas

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 goggles.

-Lab globes.

-Spatula.

-Demonstrations' guide.

-pH measuring strips

BIBLIOGRAFÍA

Basic bibliography

- J. Alcañiz, Manual de síntesis de compuestos inorgánicos en laboratorio. Publicaciones de la Universidad de Alicante (2007).
- Z. Szafran, R. M. Pike, M. M. Singh. Microscale Inorganic Chemistry: A Comprehensive 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 Technique 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).
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- Z. Szafran, R. M. Pike, M. M. Singh. Microscale Inorganic Chemistry: A Comprehensive 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

Kurso bakoitzean irakaskuntza gidan adieraziko da.

Web sites of interest

Kurso bakoitzean irakaskuntza gidan adieraziko da.

OBSERVATIONS