

GRADO EN QUÍMICA

DATOS DE LA ASIGNATURA

ASIGNATURA	DESCRIPTIVE INORGANIC CHEMISTRY	SUBJECT	DESCRIPTIVE INORGANIC CHEMISTRY
CÓDIGO	757509202		
MÓDULO	FUNDAMENTAL	MATERIA	Q. INORGÁNICA
CURSO	2º	CUATRIMESTRE	2º
DEPARTAMENTO	QUÍMICA PROFESOR JOSÉ CARLOS VÍLCHEZ MARTÍN	ÁREA DE CONOCIMIENTO	QUÍMICA INORGÁNICA
CARÁCTER	OBLIGATORIA	CAMPUS VIRTUAL	MOODLE

DISTRIBUCIÓN DE CRÉDITOS

	TOTAL	TEÓRICOS GRUPO GRANDE	TEÓRICOS GRUPO REDUCIDO	PRÁCTICAS DE INFORMÁTICA	PRÁCTICAS DE LABORATORIO	PRÁCTICAS DE CAMPO
ECTS	9	6	0	0	3	0

DATOS DEL PROFESORADO

COORDINADOR

NOMBRE	ANTONIO MARTÍNEZ MARTÍNEZ		
DEPARTAMENTO	QUÍMICA PROFESOR JOSÉ CARLOS VÍLCHEZ MARTÍN		
ÁREA DE CONOCIMIENTO	QUÍMICA INORGÁNICA		
UBICACIÓN	CIP207 (CIQSO)		
CORREO ELECTRÓNICO	antonio.martinez@dqcm.uhu.es	TELÉFONO	959219909
URL WEB		CAMPUS VIRTUAL	MOODLE

DESCRIPCIÓN GENERAL DE LA ASIGNATURA

DESCRIPCIÓN GENERAL

In this subject, the student will develop fundamental chemical knowledge of the elements from the periodic table from a systematic study of their properties, behavior, reactivity, compounds they form, and applications.

The student will learn how to relate the structure with properties, reactivity, and applications of the elements and their compounds. The student will also develop sufficient knowledge to predict their properties and reactivity.

ABSTRACT

This subject will expand the knowledge that the student has acquired about the chemistry of the elements across the periodic table, their behavior, properties, the compounds they form, and their uses and applications. Also, the student will develop skills that will complement the student's professional training as a future Chemist.

OBJETIVOS: RESULTADOS DEL APRENDIZAJE

The aim of the subject "Descriptive Inorganic Chemistry" is to provide the students a deep knowledge of the chemistry of the elements from the periodic table, their properties, reactivity, compounds they form, and their applications.

This subject is studied from the point of view of the different groups from the periodic table. Following this system, the student will advance and develop knowledge to predict the properties of the elements, compounds they form, reactivity, and uses.

REPERCUSIÓN EN EL PERFIL PROFESIONAL

The primary objective of this subject is to provide the student with complementary training, experience, and knowledge in describing and predicting the properties of the elements from the periodic table and the compounds they form, which will complement the student's professional training as a future Chemist.

Graduate students need to know about the chemistry of the elements from the periodic table and their properties to develop their careers as Chemists.

This subject training is essential, for example, in the petrochemical, agrochemical, and pharmaceutical industries and the areas of scientific research and teaching.

RECOMENDACIONES AL ALUMNADO

It is recommended that the student have completed and know the subjects Inorganic Chemistry and Structure and Bonding of Matter.

COMPETENCIAS

COMPETENCIAS BÁSICAS

COMPETENCIAS GENERALES

COMPETENCIAS TRANSVERSALES

COMPETENCIAS ESPECÍFICAS

TEMARIO Y DESCRIPCIÓN DE LOS CONTENIDOS

TEORÍA

Unit 1. Hydrogen. 1. Introduction. Physical Properties of Hydrogen. Hydrogen isotopes. Nuclear magnetic resonance. Ionized forms of hydrogen. Ortho and para-hydrogen. Preparation, Production, and Uses of Hydrogen. Hydrogen Economy. Hydrides: Classification and Properties.

Unit 2. Elements of group 1: alkali metals. Introduction. Obtaining. The Elements: properties. Chemical reactivity and trends. The solubility of halides. Chemistry in aqueous solution: macrocyclic complexes. Organometallic compounds.

Unit 3. Elements of group 2: alkaline earth metals. Introduction. Obtaining. The Elements: properties. Chemical reactivity and trends. Compounds: halides. Singularities of beryllium. Compounds: complex ions in aqueous solutions. Organometallic compounds. Diagonal relationships between Li and Mg, and between Be and Al

Unit 4. Boron, Silicon Carbon, and its compounds. Allen electronegativity. Boron. Carbon and Silicon. Carbon allotropes. Carbides: Ionic, Covalent, and Metallic. Carbon Oxides. Silicon Compounds.

Unit 5. The elements of group 15. 1.- Introduction Atomic and physical properties. Natural state, discovery, and isolation. Dinitrogen. Nitrogen compounds. The unique character of nitrogen. Dinitrogen-specific reactivity. Obtaining Nitrogen. Ammonia. Nitric acid. The phosphorus: allotropes and industrial obtaining. Phosphoric acid. Industrial obtaining of phosphoric acid.

Unit 6. The elements of group 16. General characteristics of the Elements. Dioxygen. Other combinations of oxygen. Hydrogen peroxide. Sulfur. Allotropes, preparation, structure, and applications. Oxoacids and oxo salts. Sulfuric acid.

Unit 7. The elements of group 17. Introduction. Atomic and physical properties. Natural state, discovery, and isolation. Chemical reactivity and trends. Production and Applications of the Elements. Fluorine. Chlorine. Bromine. Iodine. Halogen compounds. Hydrogen Halides.

Unit 8. Noble gases. Physical properties, natural state, production of the elements, and applications. Xenon chemistry: fluorides, oxides, oxofluorides, and other xenon compounds. Krypton combinations.

Unit 9. Post-transition metals. Aluminum, Gallium, Indium, and Thallium. Germanium, Tin, and Lead. Zinc, Cadmium and Mercury. Topic 10. Metallurgy. Obtaining and separating metals. Ellingham diagrams. Metal production: Iron and steels, Copper, Titanium, Chromium.

Unit 11. Transition metals. General considerations. The elements. Natural abundance. Extraction and uses. Physical properties Trend in chemical properties. Noble character. Representative compounds.

Unit 12. The Elements of the f-Block. The elements. Natural abundance, obtaining and uses. Physical properties of the Lanthanide contraction. Oxidation states and coordination numbers. Coordination compounds. Spectroscopic properties.

PRÁCTICAS DE LABORATORIO

Practice 1. Preparation of iron (II) sulfate heptahydrate and Mohr's salt

Practice 2. Preparation of an interhalogenated compound: ICl₃.

Practice 3. Preparation of organopolysiloxane derivatives (silicones)

Practice 4. Preparation of chromium (III) oxide and preparation of metallic chromium by the aluminothermy method.

METODOLOGÍA DOCENTE

Grupo grande

- Clases presenciales relativas a los contenidos teóricos y prácticas (problemas) de la asignatura, utilizando recursos didácticos tales como transparencias, presentaciones informatizadas y videos.
- Prácticas de laboratorio con grupos reducidos manejo de técnicas experimentales, discusión de resultados, obtención de conclusiones, presentación de una memoria final.
- Cualquier actividad dirigida que ayude a la adquisición de conocimientos, habilidades y destrezas.
- Resolución de dudas.

Prácticas de laboratorio

- Clases presenciales relativas a los contenidos teóricos y prácticas (problemas) de la asignatura, utilizando recursos didácticos tales como transparencias, presentaciones informatizadas y videos.
- Prácticas de laboratorio con grupos reducidos manejo de técnicas experimentales, discusión de resultados, obtención de conclusiones, presentación de una memoria final.
- Resolución de dudas.

CRONOGRAMA ORIENTATIVO I

SEMANAS (S):	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15
GRUPO GRANDE	U1	U2	U3	U4	U5	U5	U6	U7	U7	U8	U9	U10	U11	U12	U12
GRUPO REDUCIDO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PRÁCTICAS DE LABORATORIO	-	-	-	-	G1	G2	G3	G4	-	-	-	-	-	-	-
PRÁCTICAS DE INFORMÁTICA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PRÁCTICAS DE CAMPO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

EVALUACIÓN DE LA ASIGNATURA

PRIMERA EVALUACIÓN ORDINARIA (FEBRERO/JUNIO)

EVALUACIÓN CONTINUA

1. The continuous assessment component in this subject will consist of practical laboratory work and presentation of the results report, and academically tutored activities. 30% of the marks in the qualifying for the subject ensuing the following ratios:

- 20% corresponding to the qualification of the practices with a written exam.
- 10% corresponding to complementary activities (exercises, bibliographic works, and other activities)

2. The final exam for the subject will account for 70% of marks in the final qualifying for the subject. The exam will consist of theoretical-practical questions and problems.

A qualifying score equal to or greater than 5 points (out of 10) will be required in the final exam (70%) to add the marks from the practical laboratory work and tutored activities (30%) to the final qualifying marks. Depending on the subject's progress, a midterm exam could be considered. The grading mark will be 5 (out of 10) that will be eliminated and not compensate any other grading marks.

EVALUACIÓN FINAL

The student must communicate to the professor, within the term established by the University regulations, his willingness to be evaluated by the single final evaluation system in due course. Then, the student will fill and address the requested form to Faculty and the professor. The student will be eligible for a single final evaluation system once the request has been sent and communicated to the professor.

The qualifying marks obtained in the final exam for the subject will account for 80% of the total marking for the subject. The exam will consist of theoretical-practical questions and problems.

The remaining 20% of the marking will come from a practical exam carried out in the laboratory.

A qualifying score equal to or greater than 5 points (out of 10) will be required in the final exam (80%) to add the marks from the practical laboratory exam (20%) to the final qualifying marks.

¿Contempla una evaluación parcial?

SÍ

Depending on the subject's progress, a midterm exam could be considered. The grading mark will be 5 (out of 10) that will be eliminated and not compensate any other grading marks.

SEGUNDA EVALUACIÓN ORDINARIA

1. Two evaluation systems will be considered.

2.1.- For the continuous assessment, a practical, theoretical exam will be held to account for 80% of the final grade (it is essential to obtain a grade equal to or greater than 5 points (out of 10)). The remaining 20% will be the grade obtained in the practical exam of the ordinary call I.

2.2.- There will be a final exam for the single evaluation that will account for 100% of the grade. This exam will consist of two tests:

1.- Theoretical, practical questions from the program of the subject 80% (it is essential to obtain a grade equal to or greater than 5 points (out of 10)).

2.- Practical exam carried out in the laboratory 20%.

3.- The qualifications of the practices obtained in the ordinary evaluation I can be transferred. It will be evaluated according to point 2.1; if not, it will be evaluated following the provisions of point 2.2.

TERCERA EVALUACIÓN ORDINARIA Y OTRAS EVALUACIONES

1. Two evaluation systems will be considered.

2.1.- For the continuous assessment, a practical, theoretical exam will be held to account for 80% of the final grade (it is essential to obtain a grade equal to or greater than 5 points (out of 10)). The remaining 20% will be the grade obtained in the practical exam of the ordinary call I.

2.2.- There will be a final exam for the single evaluation that will account for 100% of the grade. This exam will consist of two tests:

1.- Theoretical, practical questions of the syllabus of the subject 80% (it is essential to obtain a grade equal to or greater than 5 points (out of 10)).

2.- Practical exam carried out in the laboratory 20%.

3.- The qualifications of the practices obtained in the ordinary evaluation I can be transferred. It will be evaluated according to point 2.1; if not, it will be evaluated following the provisions of point 2.2.

OTROS CRITERIOS DE EVALUACIÓN

¿Contempla la posibilidad de subir nota una vez realizadas las pruebas?

NO

Requisitos para la concesión de matrícula de honor

The number of honors will be governed by the procedure established by the current regulations of the University of Huelva. Honors will be awarded to the best overall marks for the subject, which must be equal to or greater than 9.5.

REFERENCIAS

BÁSICAS

1. D. Shriver, M. Weller, T. Overton, J. Rourke, "Inorganic Chemistry", 6th Ed, Oxford University Press, 2014.
2. G. Rayner-Canham, T. Overton, "Descriptive Inorganic Chemistry" Ed Prentice Hall Autores: Earnshaw y Greenwood, "The Chemistry of the Elements", Ed. Butterworth-Heinemann
3. E. Housecroft "Inorganic Chemistry" Ed Pearson Prentice Hall