



IDENTIFYING DATA

Chemistry: Chemistry 2

Subject	Chemistry: Chemistry 2			
Code	V11G200V01204			
Study programme	(*)Grao en Química			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Peña Gallego, María de los Ángeles			
Lecturers	García Martínez, Emilia Peña Gallego, María de los Ángeles Teijeira Bautista, Marta			
E-mail	qfpena@gmail.com			
Web	http://fatic.uvigo.es			
General description	The subject "Chemistry II" tries to introduce to the students in the microscopic vision of the subject, providing the necessary basis to understand disciplines more specific.			

Competencies

Code	
A1	(*)Demostrar coñecemento e comprensión de feitos esenciais, conceptos, principios e teorías en: aspectos principais da terminoloxía química, nomenclatura, conversións e unidades
A2	(*)Demostrar coñecemento e comprensión de feitos esenciais, conceptos, principios e teorías en: tipos de reacción química e as súas principais características asociadas
A5	(*)Demostrar coñecemento e comprensión de feitos esenciais, conceptos, principios e teorías en: características dos diferentes estados da materia e as teorías empregadas para describilos
A9	(*)Demostrar coñecemento e comprensión de feitos esenciais, conceptos, principios e teorías en: propiedades características dos elementos e os seus compostos, incluíndo as relacións entre grupos e as súas variacións na táboa periódica
A12	(*)Demostrar coñecemento e comprensión de feitos esenciais, conceptos, principios e teorías en: trazos estruturais dos elementos químicos e os seus compostos, incluíndo a estereoquímica
A19	(*)Aplicar os coñecementos e a comprensión á resolución de problemas cuantitativos e cualitativos de natureza básica
B1	(*)Comunicarse de forma oral e escrita en polo menos unha das linguas oficiais da Universidade
B3	(*)Aprender de forma autónoma
B4	(*)Procurar e administrar información procedente de distintas fontes
B6	(*)Manexar as matemáticas, incluíndo aspectos tales como análise de erros, estimacións de ordes de magnitude, uso correcto de unidades e modos de presentación de datos
B7	(*)Aplicar os coñecementos teóricos á práctica
B8	(*)Traballar en equipo
B9	(*)Traballar de forma autónoma
B12	(*)Planificar e administrar adecuadamente o tempo
B13	(*)Tomar decisións
B14	(*) Analizar e sintetizar información e obter conclusións
B15	(*)Avaliar de modo crítico e construtivo o entorno e a si mesmo

Learning aims

Expected results from this subject	Training and Learning Results
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	A5 A9 A19	B1 B3 B4 B6 B7 B8 B9 B12 B13 B14 B15
	A5 A19	B1 B3 B4 B7 B8 B9 B12 B13 B14
	A5 A9	B1 B3 B4 B7 B8 B9 B12 B14
	A1 A9	B1 B3 B4 B7 B8 B9 B12 B14
	A1 A2 A19	B1 B3 B4 B7 B8 B9 B12 B14
	A1 A12	
	A5 A19	B1 B3 B4 B7 B8 B9 B12 B14
	A9	B1 B3 B4 B7 B8 B9 B12 B14

	A1 A19	B1 B3 B4 B7 B8 B9 B12 B14
	A1 A19	B1 B3 B4 B7 B8 B9 B12 B14

Contents

Topic		
Subject 1: Atomic Structure	Structure of the hydrogenoid atoms : atomic orbitals, function of radial distribution, forms of the atomic orbitals. Polyelectronic atoms: Penetration and shielding, effective nuclear charge, "aufbau". Atomic parameters: atomic ionic, covalent and van der Waals radio. Lanthanide contraction. Electron affinity. Polarizability.	
Subject 2: Chemical Bonding	Theory of OM. Types of orbitals: sigma, pi, delta. Molecular orbital diagram for homo- and heteronuclear molecules. Bonding in alkene and alkyne.	
Subject 3: Nuclear Chemistry	Nuclear reactions. Types of radioactive disintegration. Stability of the nucleus. Kinetic of the disintegrations. Artificial transmutations. Nuclear fission. Nuclear fusion. Nuclear radiation: effects and units. Applications of the radioactivity.	
Subject 4: Solid State	Structure of the simple solids. Sphere packing. Structure of the metals. Alloys. Metallic bonding. Semiconductors. Ionic solids. Energetic aspects.	
Subject 5: Elements of the main groups	Elements of the main groups. Physical properties. Chemical properties. Natural resources. Methods of obtaining.	
Subject 6: Acid-base	Acid-base theories. Acid and bases of Brønsted: acid strength. Concept of pKa. Relationship between structure and acidity. Acids and bases of Lewis: Definition, examples. Fundamental types of acid-base reactions of Lewis. Solvents as acids or bases. Hard and soft acids and bases.	
Subject 7: Electrochemistry	E° and Gibbs free energy. Nernst Equation. Concentration cells. Batteries. Fuel cells. Electrolysis. Commercial electrolytic processes. Corrosion.	
Subject 8: Organic compounds and functional groups	Structure and geometry. Formulation and nomenclature of organic compounds. Physical properties.	
Tema 9: Isomerism	Geometrical isomerism. Conformational stereoisomerism. Configurational stereoisomerism.	
Subject 10: Polymers	Type of polymers by origin, composition, structure and behavior. Copolymerization. Mechanisms of polymerization. Molecular structure of the polymers. Biopolymers. Colloids and surfaces. Surface tension and surfactants.	

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	26	40	66
Others	0	0	0
Troubleshooting and / or exercises	26	40	66
Long answer tests and development	2	10	12
Short answer tests	2	4	6

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Master Session	In these sessions we will present the general aspects of the program, doing special emphasis in the bases and aspects more important.
Others	In the different activities we will pay attention to the transversal competitions as the B1, B7 or B14.

Troubleshooting and / or exercises Each week we will employ two hours to the resolution of any problems or exercises proposed related with the subject. These exercises will be delivered previously to the student through the platform Tem@.
In these sessions we can collect question or short problems in order to know the progress of the students.

Personalized attention

Methodologies	Description
Troubleshooting and / or exercises	students can ask all the questions they have in order to understand the material and develop tasks that were proposed.

Assessment

	Description	Qualification
Others	In the different activities, special attention will be taken to the transversal competitions as B1, B7 or B14.	5
Troubleshooting and / or exercises	Questions or shorts problemas can be collected in order to know the progresos of the students.	20
Long answer tests and development	Proofs for evaluation of the competitions purchased in the subject. It is necessary a minimum of 4 on 10 in this proof to take into account the rest of notes of the evaluation.	45
Short answer tests	Two tests were carried out along the course, about the subjects explained in the sessions.	30

Other comments on the Evaluation

You must attend all tests throughout the course. The final grade for the course will be the highest obtained by comparing the final exam and note examination weighted evaluation

Sources of information

Basic Bibliography

Química. R. Chang. 10ª Ed. McGraw-Hill, 2010.

Química General, 10ª Ed. R. A. Petrucci, W. S. Harwood e F.G. Herring. Ed. Prentice Hall, 2011.

Química General, 5ª Ed. K.W. Whitten, R.E. Davis e M.L. Peck. Ed. McGraw-Hill, 1998.

Química. Brown, LeMay, Bursten, Murphy. 11ª Ed., Pearson Educación, 2009.

Química. McMurry, Fay. 5ª Ed. Pearson Educación, 2009

Principios de Química, 3ª Ed. Atkins, Jones. Ed. médica panamericana, 2005.

Complementary Bibliography

1. Chemical Bonding. M. J. Winter. Oxford : Oxford University Press, 1994.
2. Química General Superior. W.L. Masterton, E.J. Slowinski e C.L. Stanitski. Ed. McGraw-Hill Interamericana, 1987.
3. Química General. T.L. Brown, H.E. Lemay e B.E. Bursten. Ed. Prentice Hall, 1998.
4. Química General. P.W. Atkins. Ed. Omega, 1992.
5. Química Orgánica. L. G. Wade. Pearson Educación, 5ª ed. Madrid 2004.
6. Química Inorgánica Descriptiva. G. Rayner-Canham. Pearson Educación, 2ª Ed. 2000.

Recommendations

Subjects that continue the syllabus

Physical chemistry 1/V11G200V01303

Inorganic chemistry 1/V11G200V01404

Organic chemistry 1/V11G200V01304

Subjects that are recommended to be taken simultaneously

Physics: Physics 2/V11G200V01201
Geology: Geology/V11G200V01205
Mathematics: Mathematics 2/V11G200V01203
(*)Química, física e xeoloxía: Laboratorio integrado II/V11G200V01202

Subjects that it is recommended to have taken before

Biology: Biology/V11G200V01101
Physics: Physics 1/V11G200V01102
Mathematics: Mathematics 1/V11G200V01104
(*)Química, física e bioloxía: Laboratorio integrado I/V11G200V01103
Chemistry: Chemistry 1/V11G200V01105
