



PORTFOLIO OF EVIDENCES

EXTRAORDINARY 2° OPPORTUNITY

SELECTED TOPICS OF CHEMISTRY

Student name: _____

Group: _____

Student ID: _____ Date: _____

Teacher: _____

The present portfolio is part of 50% of your grade. This value will be obtained as long as it meets the following requirements:

1. Write your complete identification data.
2. The portfolio must be delivered person as a requirement the day of the exam.

FOLLOW THE INSTRUCTIONS PROVIDED BY YOUR TEACHER FOR THE COMPLETION OF THIS PORTFOLIO

!!!WARNING!!!

Plagiarisms and trade of academic material contained in this portfolio will be punished under the terms of the University Legislation.

Learning Unit Objective

The Selected Topics of Chemistry Learning Unit (UA) (TSQ) has the primary objective of addressing a variety of advanced topics with very specific application within the area of Chemistry. This LU seeks not only to broaden the knowledge of Applied Chemistry, but also to seek the application of various skills such as: Mathematical reasoning, decision-making, critical thinking, among others. In order to comply with the foregoing, the following theoretical contents are addressed within the LU:

- **Important organic compounds:** The study of the main biomolecules present in beings is approached from various approaches such as their classification, functions and biological importance. In addition, the industrial application of some chemical compounds related to biomolecules is addressed.
- **Oxidation and reduction:** The main concepts related to oxidation-reduction reactions are analyzed, as well as the calculations related to the balance of oxidation-reduction equations and the applications of electrochemistry.
- **Gases and physicochemistry:** The main laws that govern the behavior of the gas state are studied, as well as their possible applications in our environment. In addition, the most relevant mathematical concepts and calculations related to the first law of thermodynamics are addressed
- **Thermodynamics and chemical kinetics:** The most relevant concepts related to the second and third laws of thermodynamics are analyzed. Also, the study of the main concepts related to chemical kinetics, the main factors that affect the speed of a reaction and the main chemical reactions from the point of view of chemical kinetics are addressed.

General policies proposed by the academy
for Learning Unit

1. The student will perform each of the activities embodied herein in accordance with the instructions included herein.
2. The student must deliver the corresponding activities on the date and in the format requested by the teacher.
3. Only the teacher who taught the learning unit in the 1st opportunity will be responsible for assigning the corresponding points to the portfolio of activities. No other teacher can modify the number of points assigned in the 2nd Chance portfolio.
4. Submitting all the activities is not a guarantee that the student will obtain the total of the corresponding points. This is because the teacher must review and evaluate the activities using an assessment instrument, in order to assign the points corresponding to the portfolio of activities.
5. If the student incurs plagiarism of all portfolio activities, then the latter will be invalidated. Likewise, if you plagiarize some sections of the portfolio, then these will be invalidated.
6. The delivery of a different version of the portfolio will be cause for automatic nullity of the document delivered.
7. Failure to read the policies of the academy, as well as the instructions for the resolution and preparation of this portfolio, does not take away the responsibility of the student and the impact that this could generate on the grade obtained.

General instructions

Please read the following instructions very carefully and carefully:

- ✓ The portfolio is fully answered by hand with blue ink pen and the student must write on each page their full name and the teacher who will take the assessment.
- ✓ Each section of the portfolio contains an assessment instrument, which the student must read to meet all assessment criteria.
- ✓ The student must respect the date, instructions and format in which the portfolio will be delivered.

Activity Portfolio Weighting

Stage	Points
Stage 1	12.5 points
Stage 2	12.5 points
Stage 3	12.5 points
Stage 4	12.5 points
Total	50 points

Stage 1

Important organic compounds



Dimension 1

Instructions:As a diagnostic activity, answer each of the following questions about organic compounds.

1- What is the difference between chemistry and chemistry?

R=

2- What are the main functions of lipids or fats in the body?

R=

3-What are the main vitamins and minerals that the human body requires?

R=

Dimension 2

Instructions: Correctly define each of the following concepts.

Biochemistry

Chemistry

Organic chemistry

Carbohydrates

Proteins

Amino acids

Lipids

Vitamins

Cholesterol

Triglycerides

Nucleic acids

Substrate

Enzyme

DNA

RNA

Soap

Saponification

Instructions: Complete the following comparative table about the main concepts related to proteins.

Amino acids:	
Proteins:	
Simple proteins:	Conjugated proteins:
Main functions of proteins:	

Dimension 4

Part I:

Instructions: Make a graphic organizer about the general classification of lipids, which should contain the following concepts and their respective definitions.

- a) Lipids
- b) Fatty acids
- c) Cholesterol
- d) Phospholipids
- e) Triglycerides

Part II:

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Instructions: Please read the following questions carefully and write the correct one or more answers, as appropriate.

1- What are the main physical and chemical differences between DNA and RNA?

R=

2- What is the difference between a nucleotide and a nucleoside?

R=

3- Mention the main biological functions of DNA.

R=

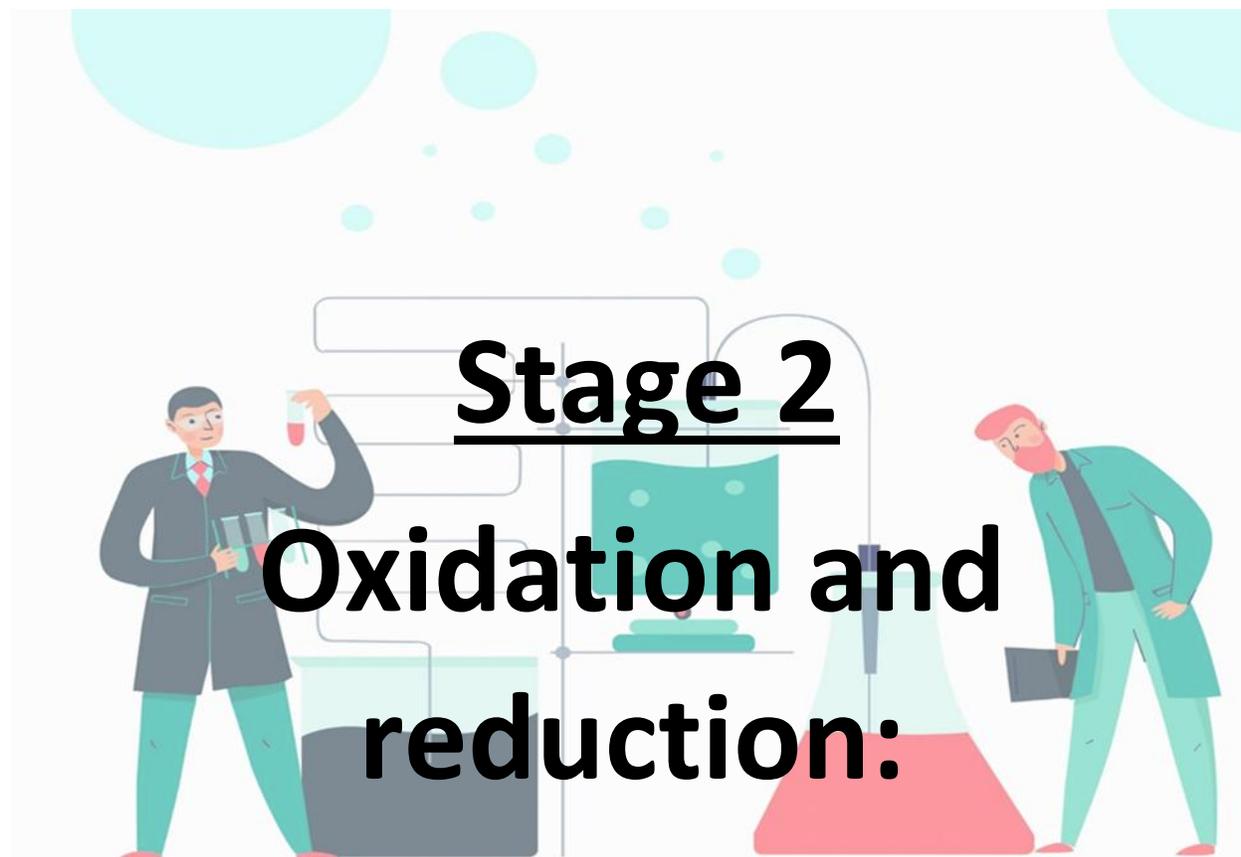
4- Describe the name and function of the main types of RNA.

R=

5- Describe the main functions of nucleic acids

R=

 Academy of Chemistry Selected Topics of Chemistry Stage 1 			
Evaluation instruments:			
General activities			
Criteria	Conforms	Does Not Meet	Score
Student correctly defined all requested concepts.			3 points
The student made the summary about the classification and major biological functions of carbohydrates and the summary is original and no plagiarism was detected.			3 points
The student successfully completed the Protein Classification Comparison Chart.			2 points
The student performed the graphic organizer with information regarding the general classification of lipids.			2 points
Student answered questions regarding nucleic acids correctly.			1.25 points
All activities were carried out following specific instructions, in order, with cleanliness and were delivered in a timely manner.			1.25 points
			Total score 1.25 points



Dimension 1

Instructions:As a diagnostic activity, answer each of the following questions about oxidation and reduction.

1-What is the difference between oxidizing agent and reducing agent?

R=

2-What is the difference between an electrolyte cell and a galvanic cell?

R=

3-What is an oxidation-reduction reaction?

R=

Dimension 2

Instructions: Match each of the following concepts with their respective statement.

<ol style="list-style-type: none"> 1. Oxidation Number 2. Oxidation 3. Reduction 4. Oxidation-reduction reaction 5. Electrochemistry 6. Galvanoplasty 7. Electrolytic cell 8. Galvanic or voltaic cell 9. Oxidizing agent 10. Reducing agent 	<p>A device that generates electrical energy from a chemical reaction of the redox type, which is spontaneous; i.e. does not require the application of electrical power to occur ()</p> <p>Chemical that loses or gives up electrons during a redox reaction ()</p> <p>Branch of Chemistry that is responsible for the study of the transformation of electrical energy into chemical energy and vice versa ()</p> <p>A chemical that within a redox type reaction has the ability to release or lose electrons ()</p> <p>Concept describing the gain of electrons by a substance in a chemical reaction ()</p> <p>A type of chemical reaction characterized by the transfer (loss and gain) between the participating substances. In addition, it is characterized by a change in oxidation number ()</p> <p>Procedure that consists in carrying out the coating of a metal with another metal, for example, when it is desired to restore shine to utensils made of silver ()</p> <p>Chemical that loses or gives up electrons during a redox reaction ()</p> <p>Numeric value that specifies the number of electrons gained or lost by a chemical species ()</p> <p>Concept describing the loss of electrons by a substance in a chemical reaction ()</p>
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Dimension 3

Instructions: For each of the following cases, please indicate if it is a oxidation or reduction process.

1- Oxygen had an oxidation state of -2 and changed to 0.

R= _____

2- Nitrogen had an oxidation state of +2 and changed to +5.

R= _____

3- Chromium had an oxidation of +7 and changed to +3.

R= _____

4- Lithium had an oxidation number 0 and changed to +1.

R= _____

5- Fluorine had an oxidation number of 0 and changed to +5

R= _____

Dimension 4

Instructions: Indicate the oxidation number for each of the following chemicals, whether they are in a free state or forming a compound, as the case may be.

a) Br_2

b) H_3PO_4

c) AlCl_3

d) KHCO_3

e) Li

f) NaH

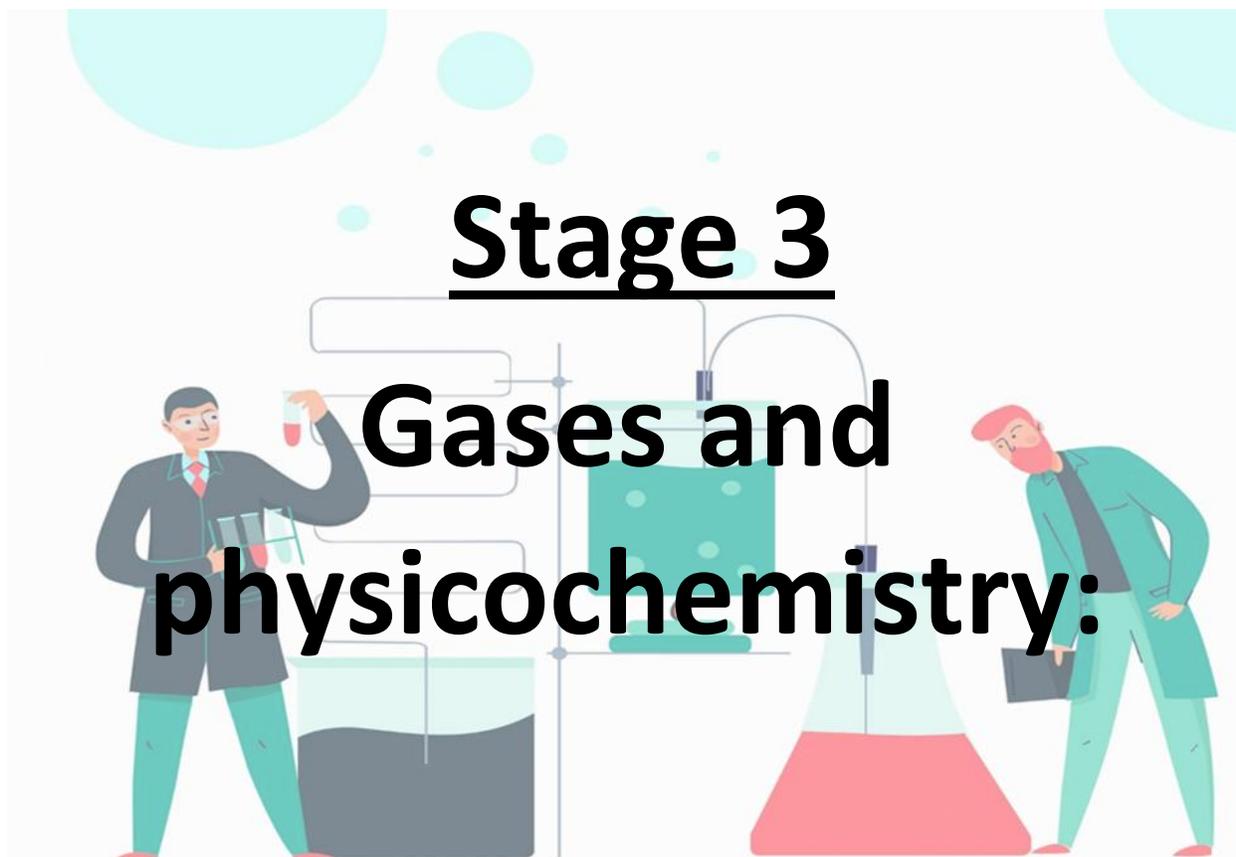
g) Fe(OH)₃

h) H₂O₂

i) CO

j) AgCl

Selected Topics of Chemistry Stage 2			
Evaluation instruments:			
General activities			
Criteria	Conforms	Does Not Meet	Score
The student correctly matched each of the concepts to their respective statement.			3 points
The student correctly identified whether each of the assigned cases corresponds to an oxidation or reduction process.			3 points
The student correctly assigned the oxidation number for each of the assigned cases.			3 points
All activities were carried out following specific instructions, in order, with cleanliness and were delivered in a timely manner.			3.5 points
			Total score 1.25 points



Dimension 1

Instructions:As a diagnostic activity, answer each of the following questions about the laws of gases and physicochemistry.

1-What are the main variables applied in the study of gases?

R=

2-What does Charles' law state and what is its mathematical formula?

R=

3- What does the first law of thermodynamics establish?

R=

4- What is the difference between heat, work and energy within physicochemistry?

R=

Dimension 2

Instructions: Correctly define each of the following concepts.

Heat

Energy

Thermodynamics

Heat capacity

Work

First Law of Thermodynamics

Enthalpy

Specific heat

Dimension 3**Part I:**

Instructions: Complete the following comparative table about the main laws applied in the study of gases.

Law	Description	Math formula
Boyle's Law		
Charles' Law		
Gay-Lussac's Law		
General Law or Combined Gas Law		

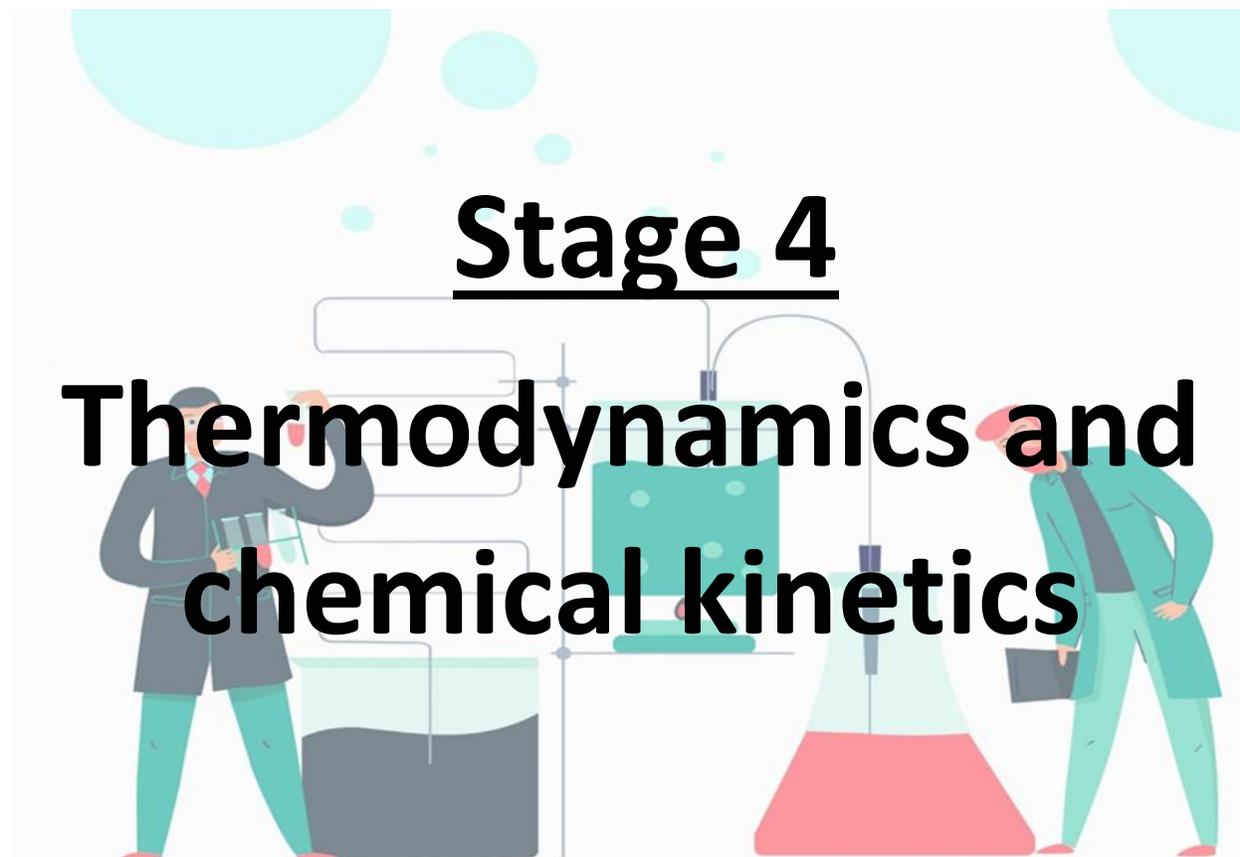
<p>Ideal Gas Law</p>		
<p>Dalton Law or Law of Partial Pressures</p>		

Dimension 4

Instructions: Create a graphic stimulator about the main gas study variables. The organizer must include the definition of each variable and examples of the units of measurement for each one.

- a) Pressure
- b) Volume
- c) Temperature
- d) Amount of gas

Selected Topics of Chemistry Stage 3			
Evaluation instruments:			
General activities			
Criteria	Conforms	Does Not Meet	Score
Student correctly defined all requested concepts.			3 points
The student correctly completed the comparison chart about the major laws applied in the study of gases.			3 points
The student carried out the documentary research about the gas laws that were requested. In addition, the documentary research was done by hand and is original.			3 points
The student prepared the graphic organizer with information regarding the main gas study variables, as well as the respective applicable units of measurement.			1 points
All activities were carried out following specific instructions, in order, with cleanliness and were delivered in a timely manner.			2.5 points
			Total score 1.25 points



Dimension 1

Instructions:As a diagnostic activity, answer each of the following questions about thermodynamics and chemical kinetics.

1- What does chemical kinetics study?

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R=

2- Mention the main factors that can affect the speed of a reaction.

R=

3- What does the second law of thermodynamics establish?

R=

4- What is activation energy?

R=

Dimension 2

Instructions: Correctly define each of the following concepts.

Second Law of Thermodynamics

Third law of thermodynamics

Chemical Kinetics

Entropy

Activation Energy

Reaction Mechanism

Quickness of reaction

Carnot Cycle

Dimension 3

Instructions: Complete the following purchasing chart about the main factors that can affect the speed of a chemical reaction.

Variable	Effects

Dimension 4

Instructions: Prepare a graphic organizer about the classification of chemical reactions, taking into account their degree of complexity from the point of view of chemical kinetics. In addition, the definition of each type of reaction must be included.

- a) Simple or elemental reaction
- b) Chain reaction

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- c) Complex or compound reaction
- d) Bidirectional reactions
- e) Consecutive or successive reactions
- f) Parallel or Competitive Reactions



**Academy of Chemistry
Selected Topics of Chemistry
Stage 4**



Evaluation instruments:

General activities

Criteria	Conforms	Does Not Meet	Score
Student correctly defined all requested concepts.			3 points
The student correctly completed the comparison chart about the main factors or variables that may affect the speed of chemical reactions.			3 points
The student developed the graphic organizer with information regarding the classification of chemical reactions from a chemical kinetic point of view.			3 points
All activities were carried out following specific instructions, in order, with cleanliness and were delivered in a timely manner.			3.5 points
			Total score 1.25 points

Performed: MC. Eduardo Lopez Martinez (Coordinator)

Approved: Chemistry Academy Members

Verified: Class Development and Support Area

Validated: ME. Nancy Elvira Tenorio Garza (Academic Secretary)