



PORTAFOLIO DE EVIDENCIAS

2DA OPORTUNIDAD EXTRAORDINARIA

Selected Topics in Chemistry

Nombre del estudiante: _____

Matrícula: _____ **Grupo:** _____

Docente: _____

Fecha: _____

El presente portafolio forma parte del 50% de tu calificación. Este valor se obtendrá siempre y cuando cumpla con los siguientes requisitos:

1. Escribe tus datos de identificación completos.
2. Adjunta el portafolio en la Plataforma Ms Teams en formato PDF, el día y hora que el docente asigne la tarea correspondiente a la segunda oportunidad; no olvides agregar tu nombre completo en cada hoja.
3. Verifica el envío correcto del portafolio.

SIGUE LAS INSTRUCCIONES BRINDADAS POR TU MAESTRO PARA EL LLENADO DE ESTE PORTAFOLIO.

¡ADVERTENCIA!

El plagio y comercio de material académico contenido en este portafolio será sancionado en los términos de la Legislación Universitaria.

Objective of the Learning Unit

The main objective of the Learning Unit (LU) of Selected Topics in Chemistry is to address several advanced topics with a very specific application within the area of Chemistry. This Learning Unit seeks not only to broaden the knowledge of applied chemistry, but also to apply diverse skills such as mathematical reasoning, mathematical reasoning, taking decisions, and the use of mathematical tools: Mathematical reasoning, decision making, critical thinking, among others. In order to comply with the above, the following theoretical contents are addressed within the LU:

- **Organic compounds of importance:** The study of the main biomolecules present in beings is approached from different focuses such as their classification, functions and biological importance. In addition, the industrial application of some chemical compounds related to biomolecules is discussed.
- **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 physical chemistry:** The main laws governing the behavior of the gaseous state are studied, as well as their possible applications in our environment. In addition, the most relevant concepts and mathematical 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 rate of a reaction and the main chemical reactions from the point of view of chemical kinetics are discussed.

General policies proposed by the academy for the Learning Unit

1. The student will perform each of the activities embodied in this document in accordance with the instructions included in this document.
2. The student must submit the corresponding activities on the date and in the format requested by the teacher.
3. Submitting all the activities is not a guarantee that the student will obtain the total of the corresponding points. This is due to the fact that the teacher must review and evaluate the activities by applying an evaluation instrument and, based on this, the points obtained in each stage will be established.
4. If the student incurs in the plagiarism of all the activities of the portfolio, then the latter will be invalidated. Likewise, if the student plagiarizes some sections of the portfolio, these will be invalidated.
5. Submitting a different version of the portfolio will be cause for automatic invalidation of the submitted document.
6. It is the student's responsibility to ensure that the portfolio is correctly uploaded to the digital platform.
7. Failure to read the policies of the academy, as well as the instructions for the resolution and elaboration of this portfolio, does not remove the responsibility of the student and the impact that this could generate in the grade obtained.

General Instructions

Read the following instructions carefully and attentively:

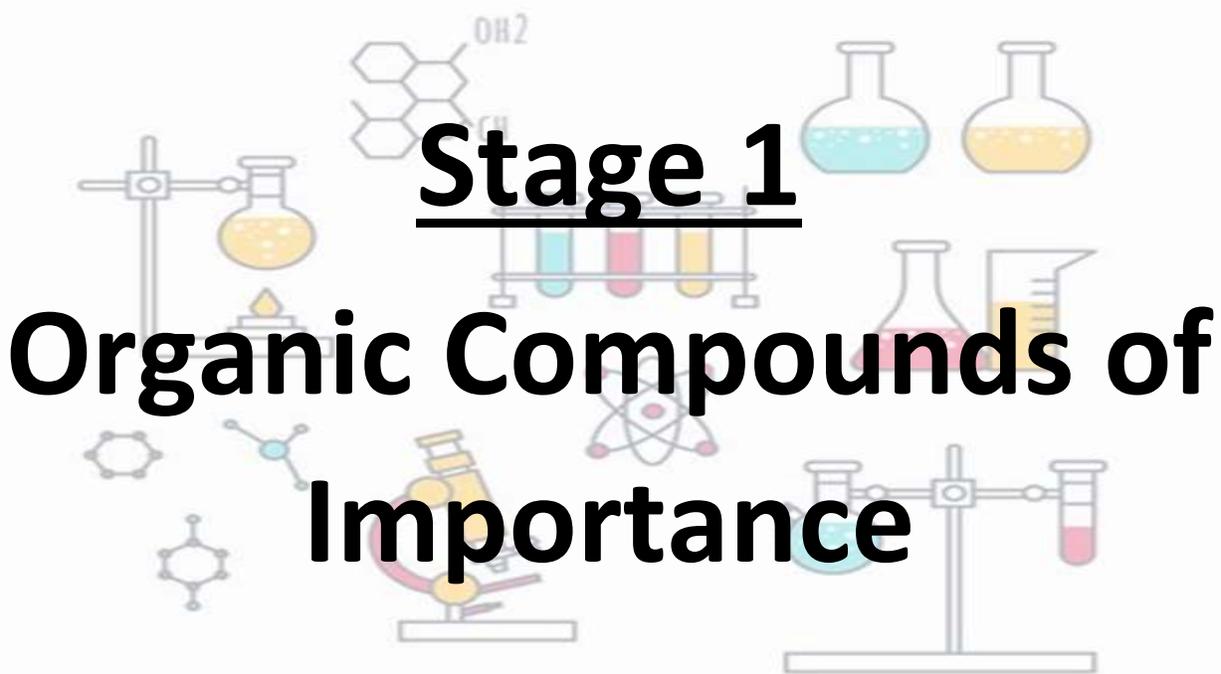
- ✓ The portfolio is to be answered entirely by hand with blue ink pen and the student must write on each page his/her full name and the name of the teacher who will carry out the evaluation.
- ✓ The portfolio will be uploaded to the MS Teams group in the section created by the teacher responsible for the evaluation
- ✓ Each section of the portfolio contains a rubric, which the student must read to meet all the evaluation criteria.
The student will deliver this portfolio of activities in pdf format and the file name will be

Port2a_TSQ_Inciales del nombre completo del estudiante.

- ✓ The student must respect the date, instructions and format in which the portfolio will be delivered.

Weighting of the portfolio of activities

Stage	Weighting
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
**Organic Compounds of
Importance**

Dimension 1

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

1-What does Biochemistry study?

R=

2- What is a biomolecule? Mention 3 examples

R=

3-What are enzymes and explain their importance?

R=

Dimension 2

Instruccions: Correctly define each of the following concepts.

Biochemistry

Chemistry

Organic chemistry

Carbohydrates

Proteins

Aminoacids

Lipids

Vitamins

Cholesterol

Triglycerides

Nucleic acids

Substrate

Enzyme

DNA

RNA

Soap

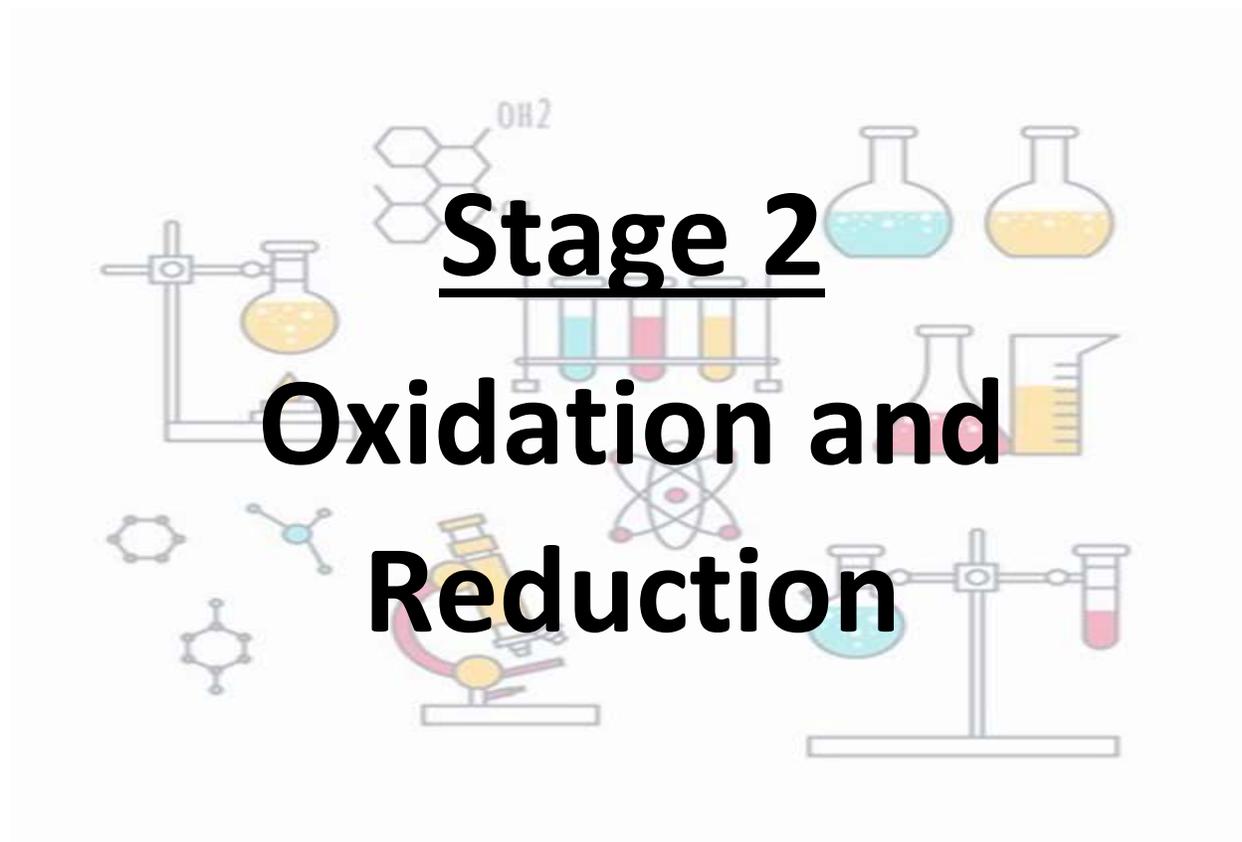
Saponification

Dimension 4

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

		Academy of Chemistry 		
Rubric for Stage 1 Activities				
Evaluation Criteria	Level Excellent 5 POINTS	Level Good 4 POINTS	Level Sufficient 3 POINTS	Level Insufficient 0 POINTS
The activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were almost completely hand-written using blue ink, legible handwriting, and cleanliness.	Half of the activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were not hand-written using blue ink, the handwriting is not legible, and there is no cleanliness observed.
The student correctly defined each of the requested concepts related to organic compounds.	The student correctly defined all requested concepts related to organic compounds.	The student correctly defined 15 out of 17 requested concepts related to organic compounds.	The student correctly defined 9 out of 17 requested concepts related to organic compounds.	The student did not correctly define none or most of the requested concepts.
The student completed the summary of carbohydrates and it has a minimum length of half a page.	The summary contains all the requested information and its length is half a page.	The summary contains most of the requested information and its length is half a page.	The summary contains half of the requested information and its length does not correspond to half a page.	The summary was not completed by the student or it does not meet any of the requested aspects.
The student created the graphic organizer about the general classification of lipids.	The graphic organizer includes all requested concepts and their respective definitions.	The graphic organizer includes 4 out of 5 requested concepts and their respective definitions.	The graphic organizer includes 4 out of 5 requested concepts and their respective definitions.	The student did not create the requested graphic organizer or it does not meet the requested criteria.
Grade		Total rubric	Weighting (Portfolio Points)	Scale from 0-100



Dimension 1

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

1-What is the difference between oxidation and reduction?

R=

2 -What is oxidation number?

R=

3- What is electrochemistry?

R=

Dimensión 2

Instructions: Relate each of the following concepts to its respective statement.

<ol style="list-style-type: none"> 1. Oxidation number 2. Oxidation 3. Reduction 4. Oxidation-reduction reaction 5. Electrochemistry 6. Electroplating 7. Electrolytic cell 8. Galvanic or voltaic cell 9. Oxidizing agent 10. Reducing agent 	<p>Device that generates electrical energy from a redox chemical reaction, which is spontaneous; that is, it does not require the application of electrical energy to occur ()</p> <p>Chemical substance that loses or gives up electrons during a redox reaction ().</p> <p>Branch of chemistry that studies the transformation of electrical energy into chemical energy and vice versa ().</p> <p>Chemical substance that in a redox reaction has the capacity to release or lose electrons ().</p> <p>Concept that describes 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 the oxidation number ()</p> <p>Procedure consisting of coating one metal with another metal, e.g., to restore the shine of silver utensils ()</p> <p>Chemical substance that loses or gives up electrons during a redox reaction ()</p> <p>Numerical value specifying 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 indicate whether it corresponds to an oxidation or reduction process.

1- The iron had an oxidation state of 0 and changed to +2.

R= _____

2- Chlorine had an oxidation state of +7 and changed to -1.

R= _____

3- Manganese had an oxidation state of +5 and changed to +3.

R= _____

4- Bromine had an oxidation number of -1 and changed to +5.

R= _____

5- Silver had an oxidation number of 0 and changed to +1.

R= _____

Dimension 4

Instructions: State the oxidation number for each of the following chemical elements free or within a compound.

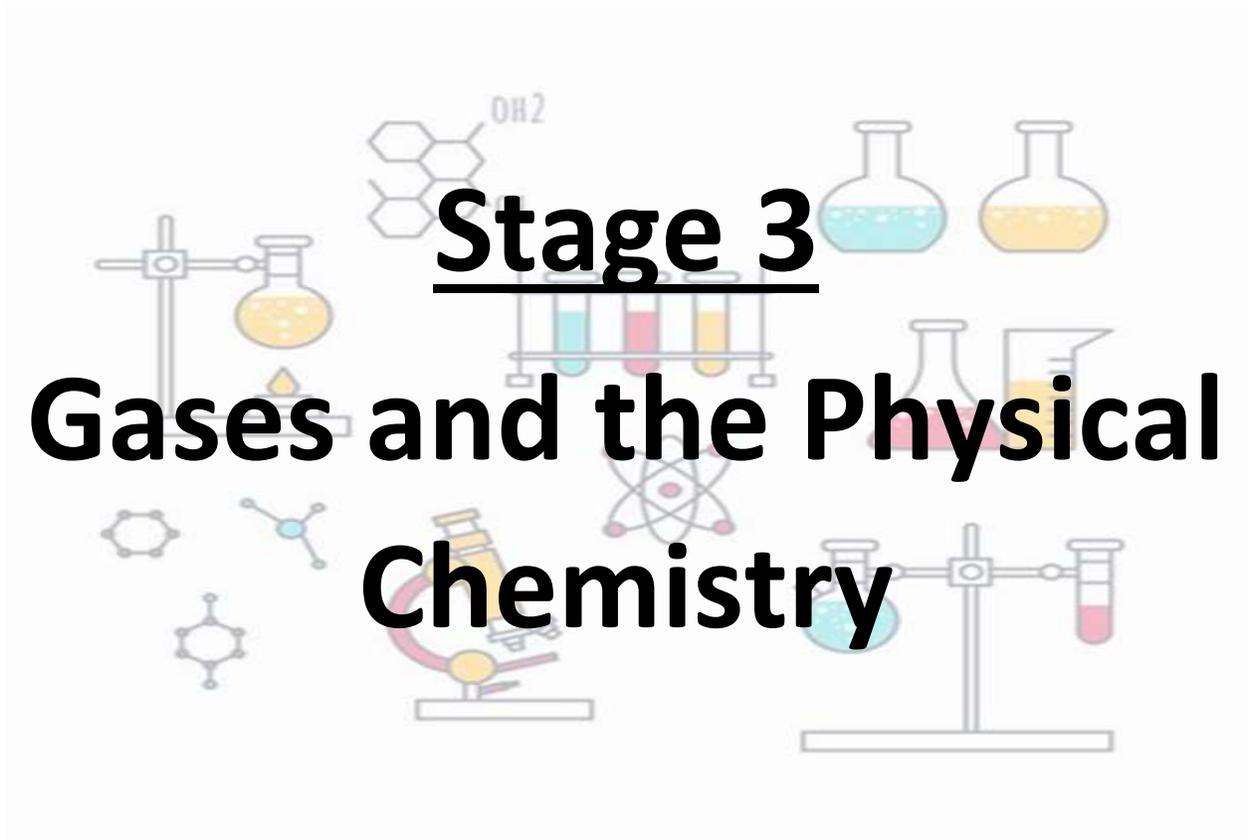
a) O₂

b) H₂SO₄

c) CaF₂

d) LiNaHPO₄

Academy of Chemistry				
Rubric for Stage 2 Activities				
Evaluation Criteria	Level Excelente 5 POINTS	Level Bueno 4 POINTS	Level Suficiente 3 POINTS	Level Insuficiente 0 POINTS
The activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were almost completely hand-written using blue ink, legible handwriting, and cleanliness.	Half of the activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were not hand-written using blue ink, the handwriting is not legible, and there is no cleanliness observed.
The student correctly matched the concepts with their respective statements.	The student correctly matched all concepts with their respective statements.	The student correctly matched 7 out of 10 concepts with their respective statements.	The student correctly matched 5 out of 10 concepts with their respective statements.	The student did not correctly match any of the statements with their respective concepts.
The student correctly identified whether each statement corresponded to a process of oxidation or reduction.	The student correctly identified oxidation and reduction processes in all statements.	The student correctly identified oxidation and reduction processes in only 4 out of 5 statements.	The student correctly identified oxidation and reduction processes in only 3 out of 5 statements.	The student did not correctly identify oxidation and reduction processes in any of the statements.
The student correctly assigned oxidation numbers for free elements and for those that are part of a compound.	The student correctly assigned oxidation numbers for all free elements and for those that are part of a compound.	The student correctly assigned oxidation numbers for free elements and for those that are part of a compound in 3 out of 4 exercises.	The student correctly assigned oxidation numbers for free elements and for those that are part of a compound in 2 out of 4 exercises.	The student did not correctly assign oxidation numbers in all exercises.
Grade		Total rubric	Weighting (Portfolio Points)	Scale from 0-100



Stage 3
Gases and the Physical Chemistry

The background features a collage of chemistry-related icons: a Bunsen burner, a flask on a stand with yellow liquid, a molecular structure with 'OH2', two flasks with blue and yellow liquids, a rack of test tubes with colored liquids, a microscope, a balance scale, and various molecular models.

Dimension 1

Instructions: As a diagnostic activity answer each of the following questions about gas laws and physical chemistry.

1- Name at least three laws that apply to the study of gases.

R=

2-¿What is physical chemistry?

R=

3- What does the first law of thermodynamics state?

R=

Dimension 2

Instructions: Correctly define each of the following concepts.

Heat

Energy

Thermodynamics

Chemical thermodynamics

Work

First law of thermodynamics

Enthalpy

Specific heat

Dimension 3

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

Law	Description	Chemical formula
Boyle`s law		
Charles`s law		
Gay-Lussac`s law		

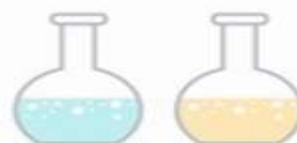
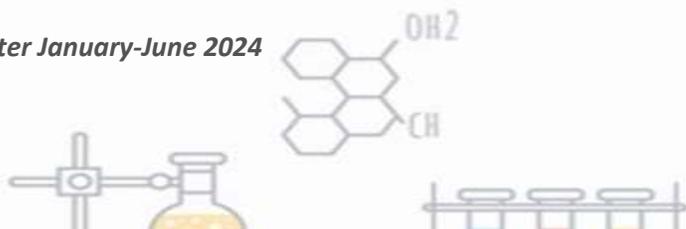
General or combined gas law		
Ideal gas law		
Dalton's law or law of partial pressures		

Dimension 4

Instructions: Develop a graphic organizer about the main variables in the study of gases. The organizer should include the definition of each variable and examples of units of measurement for each.

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

		Academy of Chemistry 		
Rubric for Stage 3 Activities				
Evaluation Criteria	Level Excellent 5 POINTS	Level Good 4 POINTS	Level Sufficient 3 POINTS	Level Insufficient 0 POINTS
The activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were almost entirely hand-written using blue ink, legible handwriting, and cleanliness.	Half of the activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were not hand-written using blue ink, the handwriting is not legible, and there is no cleanliness observed.
The student correctly defined concepts related to physicochemistry.	The student correctly defined all requested concepts.	The student only correctly defined 7 out of the 8 requested concepts.	The student only correctly defined 4 out of the 8 requested concepts.	The student did not correctly define any of the requested concepts.
The student completed the comparative table of the main gas laws correctly.	The student completed the comparative table of the main gas laws entirely correctly.	The student completed the comparative table of gas laws, and most of the information is correct.	The student completed the comparative table of gas laws, and only half of the information is correct.	The student did not complete the comparative table, or the information provided is incomplete or incorrect.
The student created the graphic organizer of the main study variables of gases.	The graphic organizer contains all requested information.	The graphic organizer includes only the requested information for 3 out of the 4 gas variables.	The graphic organizer includes only the requested information for 2 out of the 4 gas variables.	The graphic organizer was not created or does not contain the requested information.
Grade	Total rubric		Weighting (Portfolio Points)	Scale from 0-100



Stage 4

Thermodynamics and Chemical Kinetics

Dimension 1

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

1 -What is chemical kinetics?

R=

2-Name the main factors that can affect the rate of a reaction.

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R=

3-What does the second law of thermodynamics state?

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

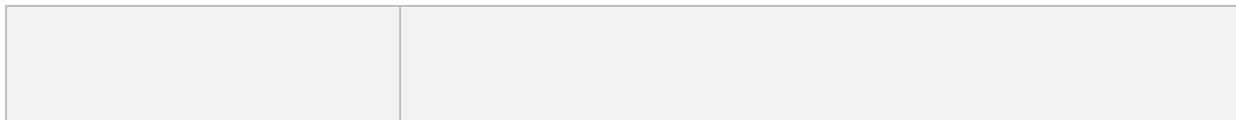
Reaction rate

Carnot cycle

Dimension 3

Instructions: Complete the following comparativ table about the main factors that can affect the rate of a chemical reaction

Variable	Effects



Dimensión 4

Develop 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 should be included.

- a) Elemental or simple reaction
- b) Chain reaction
- c) Complex or compound reaction
- d) Bidirectional reactions
- e) Consecutive or successive reactions
- f) Parallel or competitive reactions

		Academy of Chemistry 		
Rubric for Stage 4 Activities				
Evaluation Criteria	Level Excellent 5 POINTS	Level Good 4 POINTS	Level Sufficient 3 POINTS	Level Insufficient 0 POINTS
The activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were almost entirely hand-written using blue ink, legible handwriting, and cleanliness.	Half of the activities were hand-written using blue ink, legible handwriting, and cleanliness.	The activities were not hand-written using blue ink, the handwriting is not legible, and there is no cleanliness observed.
The student correctly defined concepts related to thermodynamics.	The student correctly defined all requested concepts.	The student only correctly defined 7 out of the 8 requested concepts.	The student only correctly defined 4 out of the 8 requested concepts.	The student did not correctly define any of the requested concepts.
The student completed the comparative table regarding the main variables affecting reaction rate correctly.	The comparative table includes all variables involved in the study of reaction rate, as well as their possible effects.	The comparative table includes only 5 out of the 7 variables involved in the study of reaction rate, as well as their possible effects.	The comparative table includes only 4 out of the 7 variables involved in the study of reaction rate, as well as their possible effects.	The comparative table does not include the requested information regarding the main variables affecting reaction rate.
The student created the graphic organizer of reaction classification according to chemical kinetics.	The graphic organizer contains all requested information.	The graphic organizer includes only the requested information for 5 out of the 6 types of reaction according to chemical kinetics.	The graphic organizer includes only the requested information for 3 out of the 6 types of reaction according to chemical kinetics.	The graphic organizer was not created or does not contain the requested information.
Grade		Total rubric	Weighting (Portfolio points)	Scale from 0-100

Made by: M.C. Eduardo López Martínez

Approved by: Miembros de Academia

Verified by: Apoyo y Desarrollo de Clase

Validated by: ME. Nancy Elvira Tenorio Garza (Secretaria Académica)