

Fourth Marking Period

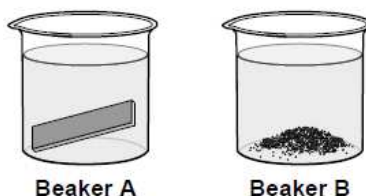
Multiple Choice Homework

Each lecture in class is accompanied by five (5) multiple choice questions, which will be instrumental in helping you reinforce the material covered in class, and help you study for the test. ALL of the questions for a particular unit will be due the day of the test, when this booklet will be turned into me for a homework grade. If you finish a section before the day of the test I will grade it for you, allowing you to see which questions you missed, however I will not put a grade in the grade book for the homework till the day of the test. Meaning I will grade any section as many times as you like till you get all the questions correct. Do not miss the opportunity to earn an easy 100 in the grade book

Unit 10 Homework

Collision Theory

Use the following diagram to answer the next two (2) questions. Each beaker contains 2.2 grams of iron and 1.0 L of 3.0M H_2SO_4 at standard temperature and pressure



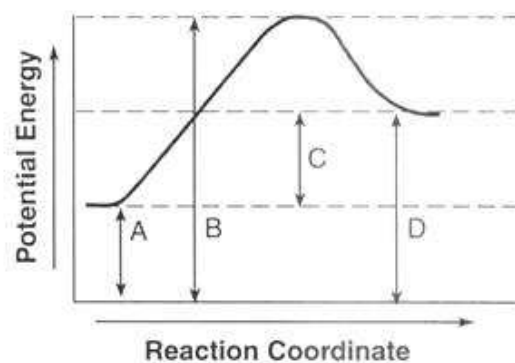
- 1. Which beaker will react the fastest?**
 - a. Beaker A
 - b. Beaker B
 - c. They will both react at the same rate
 - d. Impossible to know without knowing the activation energy of the reaction
- 2. Both beakers produce hydrogen gas (H_2), which of the following would cause both beakers to increase the speed at which the gas is produced?**
 - a. Increase the air pressure around the beakers
 - b. Decrease the air pressure around the beakers
 - c. Heat the solutions
 - d. Cool the solution
- 3. Nitrogen and hydrogen gas is produced by the decomposition of ammonia gas. Given the equation below, what will increase the rate of production of nitrogen and hydrogen?**
$$\text{Heat} + 2\text{NH}_3 \rightarrow \text{N}_2 + 3\text{H}_2$$
 - a. Heat the reaction up
 - b. Cool the reaction down
 - c. Crush up the ammonia
 - d. Decrease the volume of the reaction
- 4. If the temperature of a reaction is decreased, the reaction proceeds at a much slower rate because the--**
 - a. Frequency of collisions between reactants decreases
 - b. Energy of the reactant decrease
 - c. Activation energy decreases
 - d. Energy of the activation complex decreases
- 5. When seltzer tablets are placed in a glass of water, they fizz as they release a gas. To increase the speed that gas is released from each tablet, it would be best to increase the--**
 - a. Amount of water
 - b. Volume of the glass
 - c. Hardness of the water
 - d. Crush up the tablet

Potential Energy (Enthalpy)

1. A solid dissolves in water and the solution becomes quite hot, which of the following is TRUE about the dissolution of the solid?
 - a. The process is endothermic
 - b. The process has a negative enthalpy ($-\Delta H$)
 - c. The amount of entropy, ΔS , is decreasing
 - d. The solubility will be the same regardless of the temperature of the water

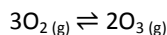
The next four (4) questions refer to the potential energy diagram to the right

2. The line that represents the enthalpy of the reaction (ΔH_{Rxn}) is
3. Which line would be changed with the addition of a catalyst (if more than one answer is correct select all that apply)
4. Which of the following statements can be made about this reaction based solely on this graph
 - a. $\Delta H < 0$
 - b. $\Delta S > 0$
 - c. $\Delta H > 0$
 - d. $\Delta S = 0$
5. The surrounds of this reaction would:
 - a. Increase in temperature
 - b. Decrease in temperature
 - c. See no change in temperature
 - d. Impossible to know how the surrounds would react to this reaction



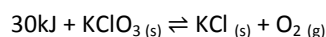
Le Châtelier

Ozone is created in the upper atmosphere by the reaction shown below. Use this equation to answer the next two (2) questions



1. When a sealed container at an equivalent pressure and temperature reaches equilibrium, which must be true?
 - a. The maximum number of molecules has been reached
 - b. No $\text{O}_2(\text{g})$ is present
 - c. No $\text{O}_3(\text{g})$ is present
 - d. The rates of the forward & reverse reactions are equal
2. Which of the following conditions will produce more $\text{O}_3(\text{g})$?
 - a. Double the amount of O_2 & O_3
 - b. Reduce the pressure
 - c. Increase the pressure
 - d. Remove some O_2

Use the following reaction to answer the next three (3) questions



3. Increasing the temperature of the reaction would:

- Increase the amount of KClO_3 in the flask
- Increase the pressure in the flask
- Decrease the amount of KCl present
- Decrease the pressure in the flask

4. Increasing the pressure of the container will

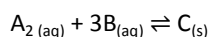
- Increase the amount of O_2 produce
- Produce more KCl
- Produce more KClO_3
- Have no effect on the reaction

5. If a catalyst was added to the reaction which of the following will occur?

- Have no effect
- Shift to favor the production of products
- Shift to favor the production of reactants
- Increase the temperature of the reaction

Equilibrium Expression

Use the following reaction to answer the next two (2) questions



1. Which of the following correctly shows the equilibrium expression

- $K = \frac{[\text{C}]}{[\text{A}_2][\text{B}]^3}$
- $K = \frac{[\text{C}]}{[\text{A}]^2[\text{B}]^3}$
- $K = \frac{1}{[\text{A}]^2[\text{B}]^3}$
- $K = \frac{1}{[\text{A}_2][\text{B}]^3}$

3. Given the following equilibrium expression (K), what is a possible reaction?

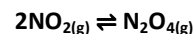
$$K = \frac{[\text{H}_3\text{O}^+][\text{SO}_4^{2-}]}{[\text{HSO}_4^-]}$$

- $\text{HSO}_4^-(\text{aq}) + \text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{H}_3\text{O}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq})$
- $\text{H}_3\text{O}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightleftharpoons \text{HSO}_4^-(\text{aq}) + \text{H}_2\text{O}(\text{l})$
- $\text{H}_3\text{O}^+(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \rightleftharpoons \text{HSO}_4^-(\text{aq})$
- $\text{H}_2 + \text{SO}_4^{2-}(\text{aq}) \rightleftharpoons \text{HSO}_4^-(\text{aq})$

2. If the value of the equilibrium constant is 3.1×10^{-2} , which of the following statements would be true?

- At equilibrium there are more products than reactants
- The forward reaction is favored
- The reverse reaction is favored
- At equilibrium there are equal amounts of reactants and products

4. At equilibrium 10 mol NO_2 , and 50 mol N_2O_4 were found in a closed container. Given the reaction below, what is the value of the equilibrium constant?



- $K = 5$
- $K = 0.5$
- $K = 0.2$
- $K = 2$

5. Which of the following changes to a system at equilibrium would change the value of the equilibrium constant

- Adding reactants
- Adding products
- Adding a catalyst
- Changing the temperature

Unit 10 Homework

Name: _____

Collision Theory

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Potential Energy

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Le Châtelier

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Equilibrium Expression

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Unit 11 Homework

Acid/Base Nomenclature

- Which of the following is paired **INCORRECTLY**?
 - Hydrobromic acid, HBr
 - Sulfuric acid, H_2SO_4
 - Nitric acid, HNO_2
 - Perchloric acid, HClO_4
- Which of the following is the correct formula for **Iodic acid**?
 - HI
 - HIO
 - HIO_2
 - HIO_3
- What is the name of the acid whose formula is **$\text{HC}_2\text{H}_3\text{O}_2$** ?
 - Acetic acid
 - Carbonic acid
 - Oxalic acid
 - Dicarboxylic acid
- Which of the following acids is an exception to the following generality to naming acids? "The prefix hydro- is used when an acid is binary (containing only 2 elements)"
 - H_2SO_3
 - HBr
 - HCN
 - HBrO_4
- What number is the variable X in the formula for phosphoric acid, H_xPO_4 ?
 - 1
 - 2
 - 3
 - 0

Acid Base Theory

Use the following choices to answer the next two (2) questions. Choices maybe used once, more than once, or not at all

- HI
- NH_3
- HSO_3^-
- H_2CO_3

- Which of the following could **NOT** act as **Brønsted–Lowry acid**?
 - NH_4^+
 - OH^-
 - H_2O
 - H_2SO_4

Use the next answer choices to answer the next two (2) questions. Choices maybe used once, more than once, or not at all.

- Is a Lewis base
- Is the conjugate base of H_2SO_3
 - BF_3
 - H_2SO_4
 - HCl
 - HI

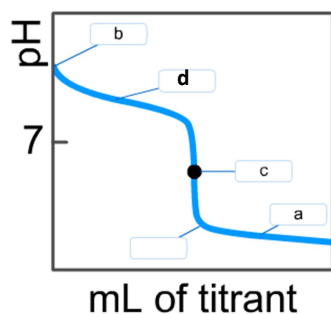
- Which of the following is an example of a Lewis acid?
- Which is **NOT** an Arrhenius acid?

The pH Scale

- All of the following will be acidic EXCEPT:
 - H_2SO_4
 - HCl
 - NH_3
 - $\text{HC}_2\text{H}_3\text{O}_2$
- A solution of $\text{Ca}(\text{OH})_2$ has a concentration of $5.0 \times 10^{-4}\text{M}$, what is the pH of this solution?
 - 5.0×10^{-4}
 - 1.0×10^{-3}
 - 3.0
 - 11.0
- A solution of NaOH has a pH of 9.0, what is the concentration of NaOH in solution?
 - 1×10^{-9}
 - 1×10^{-5}
 - 9
 - 5
- A solution of H_2SO_4 has pH of 2.5, what is the pOH of the solution?
 - 2.5
 - 11.5
 - 3.2×10^{-3}
 - 3.2×10^{-12}
- The strong base $\text{Ca}(\text{OH})_2$ is neutralized by the weak acid hydrocyanic acid, HCN . The resulting salt, $\text{Ca}(\text{CN})_2$ is:
 - Basic
 - Acidic
 - Neutral
 - There is insufficient information to determine the nature of the salt

Neutralization Reactions

A weak base, NH_3 , is titrated with a known concentration of HCl , a strong acid, to produce the following titration curve. Use the following titration curve to answer the next three (3) questions.



- What indicator is pink in basic solutions, but clear in acidic solutions?
 - Phenolphthalein
 - Methylene blue
 - Litmus
 - Methyl yellow
- The point when the moles of acid are equivalent to the moles of base, and moles of salt
- The point where the MOST acid has been added
- Why is the pH when the base has been neutralized not 7.0?
 - The pH probe is broken
 - NH_4Cl is a basic salt
 - NH_4Cl is an acidic salt
 - Too much acid was added
- If 25mL of hydrobromic acid, HBr , with an unknown concentration is neutralized by 12.5mL of strontium hydroxide, $\text{Sr}(\text{OH})_2$, with a concentration of 0.01M, what is the concentration of the acid?
 - 0.005
 - 0.01
 - 0.02
 - 0.10

Oxidation & Reduction

Use the following choices to answer the next three (3) questions. Choices maybe used once, more than once, or not at all.

- a. -2
- b. 0
- c. +1
- d. +7

4. In the reaction below, which of the following is true?



- a. ClO^- is the oxidizing agent
- b. ClO^- is the reducing agent
- c. OH^- is the oxidizing agent
- d. ClO^- is both the oxidizing agent & reducing agent

- 1. Oxidation state of an atom of I in $\text{I}_{2(s)}$
- 2. Oxidation state of Mn in the MnO_4^- ion
- 3. Oxidation state of O in SO_3

5. Which of these half reactions represents oxidation?

- a. $\text{Pb}^{4+} \rightarrow \text{Pb}^{2+}$
- b. $\text{MnO}_4^- \rightarrow \text{Mn}^{2+}$
- c. $\text{Br}_2 \rightarrow \text{BrO}_3^-$
- d. $\text{O}_{2(s)} \rightarrow \text{O}_{2(l)}$

Unit 11 Homework

Name: _____

Nomenclature

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Acid-Base Theory

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

pH

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

Neutralization

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D

RedOx

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D