

# Gen Chem 2 Exam 1

## GENERAL CHEMISTRY 2 CHAPTER TEST 2

Name: \_\_\_\_\_ Score: \_\_\_\_\_  
Section: \_\_\_\_\_ Date: \_\_\_\_\_

Direction: Choose the letter of the correct answer. (*Strictly no erasures on your answer sheets.*)

- It is a special type of homogeneous mixture composed of two or more substances.  
a. suspension    b. **solution**    c. colloids    d. alloys
- Which of the following is an example of liquid in a solid solution?  
a. Air    b. Brass    c. vinegar    d. **dental amalgam**
- You are tasked to analyze a water sample containing contaminants. In what unit of concentration you are going to report the results of analysis?  
a. **parts per million**    b. percent    c. Molarity    d. molality
- What is the mole fraction of solvent in 40% isopropyl alcohol solution? (Molar mass isopropyl = 60.1 g/mol; molar mass of water = 18.0 g/mol)  
a. 0.16    b. 0.67    c. **0.84**    d. 3.3
- What is the concentration, in ppm, if 0.025 g KCl is dissolved in 100 grams of water?  
a.  $2.5 \times 10^{-4}$  ppm    b. 2.5 ppm    c.  $4.0 \times 10^2$  ppm    d. **250 ppm**
- Which of the following statement is TRUE about molality?  
a. Molality is temperature dependent  
b. Molality is represented by moles / L  
c. Molality gives a less accurate value than molarity.  
d. **Molality gives a more accurate value than molarity.**
- The term homogeneous mixtures signify that  
a. its properties are uniform throughout the mixture.  
b. its composition is uniform throughout the mixture.  
c. **both composition and properties are uniform throughout the mixture.**  
d. neither composition nor properties are uniform throughout the mixture.
- Which of the following is a quantitative description of the solution?  
a. Diluted    b. concentrated    c. saturated    d. **molality**
- Calculate the molarity of liquid HCl will be if density of the solution is 1.17 g/cc. (MM of HCl = 36.46 g/mol; 1 cc = 1 mL, 1 L = 1000 mL)  
a. 31.16 M    b. **32.09 M**    c. 31.16 m    d. 32.09 m
- What is the molarity of 20% (w/v) sulfuric acid ( $\text{H}_2\text{SO}_4$ ) solution?  
a. 0.51 M    b. 1.02 M    c. **2.04 M**    d. 4.08 M
- Which of the following is used as an indicator in the titration of a weak acid and a strong base?  
a. Methyl orange (3 to 4.6)    b. Bromothymol blue (6 to 7.5)    c. Methyl red (5 to 6.9)  
d. **Phenolphthalein (8 to 9.6)**
- Arrange the procedure in based on the correct sequence of the titration process.  
I. Indicator is added to the solution.  
II. A specified amount of analyte is placed on the Erlenmeyer flask.  
III. Titrate the sample until a distinct change in the color of the solution is observed.  
IV. Titrant is placed in a burette to titrate the sample containing indicator:  
a. I, II, III and IV    b. II, III, IV and I    c. III, IV, II and I    d. **I, I, IV and III**
- The following is an indication that the end-point of titration is reached except  
a. **The solution becomes dark pink in color.**  
b. All the acid has been neutralized by the base.  
c. A distinct change in the color of an indicator is noticeable.  
d. The solution changes in color from clear to light pink solution.
- What is the concentration of the sulphuric acid solution if 50 ml of 0.5 M  $\text{Ba}(\text{OH})_2$  solution is added to 100 ml of the solution?  
a. **0.25 M**    b. 0.5 M    c. 2.5 M    d. 50 m
- Find the concentration of HCl, if 10 mL of 0.5 M  $\text{Ca}(\text{OH})_2$  is required to titrate 50 mL of HCl.  
$$2\text{HCl (aq)} + \text{Ca}(\text{OH})_2 \text{ (aq)} \rightarrow \text{CaCl}_2 \text{ (aq)} + 2\text{H}_2\text{O (l)}$$
  
a. 0.1 M    b. **0.2 M**    c. 0.5 M    d. 1.0 M
- Using the following equation:  
$$2\text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow 2\text{H}_2\text{O} + \text{Na}_2\text{SO}_4$$
  
How many grams of sodium sulfate will be formed, if you start with 1.25 L of a 4.0 M sodium hydroxide? (Atomic mass: Na=23.0, O=16.0, H=1.0, S=32.0.)  
a. 1420 g    b. 710.0 g    c. **355.0 g**    d. 0.7040 g

Gen Chem 2 Exam 1 is a pivotal assessment that marks the transition from introductory chemistry concepts to more complex theories and applications. This exam typically covers a variety of topics that are essential for students aiming to deepen their understanding of chemistry. In this article, we will explore the key topics often included in the exam, study strategies, and tips for success to help students prepare effectively.

## Key Topics Covered in Gen Chem 2 Exam 1

In a general chemistry course, the second semester (Gen Chem 2) often delves into topics such as chemical equilibria, thermodynamics, kinetics, and the properties of solutions. Below are some of the primary subjects that students should focus on for Exam 1.

# Chemical Equilibrium

Chemical equilibrium is a fundamental concept that describes the state in which the concentrations of reactants and products remain constant over time. Key points to understand include:

1. Dynamic Nature: Even at equilibrium, reactions continue to occur, but at equal rates in both directions.
2. Equilibrium Constant (K): This is a numerical value that expresses the ratio of the concentration of products to reactants at equilibrium.
3. Le Chatelier's Principle: This principle states that if an external change is applied to a system at equilibrium, the system adjusts to counteract that change and restore a new equilibrium state.

## Acid-Base Equilibria

Acid-base chemistry is closely tied to equilibrium concepts. Students should be familiar with:

- pH and pOH Calculations: Understanding how to calculate pH from hydrogen ion concentration and vice versa.
- Strong vs. Weak Acids and Bases: Recognizing the difference in dissociation and how it affects equilibrium.
- Buffer Solutions: Comprehending how buffers work and their importance in maintaining pH in biological systems.

## Thermodynamics

Thermodynamics involves the study of energy changes during chemical reactions. Key topics include:

- First Law of Thermodynamics: Energy cannot be created or destroyed, only transformed.
- Enthalpy ( $\Delta H$ ): Understanding how to calculate changes in enthalpy for reactions and the concept of exothermic and endothermic processes.
- Gibbs Free Energy ( $\Delta G$ ): This helps predict the spontaneity of reactions. The relationship between  $\Delta G$ ,  $\Delta H$ , and entropy ( $\Delta S$ ) is crucial.

## Kinetics

Chemical kinetics focuses on the rates of reactions and the factors that affect them. Important concepts include:

- Rate Laws: The mathematical relationship between the rate of a reaction and the concentration of reactants.
- Activation Energy: The energy barrier that must be overcome for a reaction to occur.
- Catalysts: Substances that speed up reactions without being consumed in the process.

# Properties of Solutions

Understanding the properties of solutions is essential for a comprehensive grasp of chemistry. Topics to study include:

- Concentration Units: Molarity, molality, and percent solutions.
- Colligative Properties: Properties that depend on the number of solute particles in a solution, such as boiling point elevation and freezing point depression.
- Solubility: Factors affecting solubility and how to interpret solubility product constants ( $K_{sp}$ ).

## Study Strategies for Gen Chem 2 Exam 1

Preparing for the Gen Chem 2 Exam 1 requires a systematic approach. Here are effective study strategies:

### 1. Organize Study Materials

- Lecture Notes: Ensure that your notes are complete and well-organized. Highlight key concepts and definitions.
- Textbook: Use your textbook as a reference. Pay attention to end-of-chapter summaries and review questions.
- Online Resources: Utilize online platforms like Khan Academy, Coursera, or YouTube for supplementary explanations and tutorials.

### 2. Practice Problems

- End-of-Chapter Problems: Work through problems provided in your textbook. Focus on a variety of problem types to build confidence.
- Old Exams: If available, practice with old exams or sample questions. This will give you a feel for the exam format and question style.

### 3. Form Study Groups

- Collaborative Learning: Join or form a study group. Discussing topics with peers can enhance understanding and retention.
- Teach Back Method: Try to teach complex topics to your peers. Explaining concepts can reinforce your understanding.

### 4. Utilize Flashcards

- Key Terms and Equations: Create flashcards for important definitions, formulas, and concepts. This is an effective way to memorize critical information.
- Regular Review: Review your flashcards regularly, focusing more on areas where you feel less confident.

## **5. Time Management**

- Create a Study Schedule: Break your study sessions into manageable chunks and allocate specific times for each topic.
- Avoid Cramming: Start studying well in advance of the exam date to give yourself ample time to absorb the material.

## **Exam Day Tips**

When the day of the Gen Chem 2 Exam 1 arrives, being well-prepared can significantly impact your performance. Here are some last-minute tips:

### **1. Get Plenty of Rest**

Ensure you have a good night's sleep before the exam. A well-rested mind is more alert and capable of recalling information.

### **2. Have a Healthy Breakfast**

Eat a balanced breakfast to fuel your brain. Foods rich in protein and whole grains can provide sustained energy.

### **3. Arrive Early**

Give yourself plenty of time to arrive at the exam location. This will help reduce anxiety and allow you to settle in before the exam begins.

### **4. Read Instructions Carefully**

Take the time to read all instructions and questions carefully during the exam. Make sure you understand what is being asked before answering.

## **5. Manage Your Time During the Exam**

Allocate your time wisely, ensuring you have enough time to answer all questions. If you find a question challenging, move on and return to it if time permits.

## **Conclusion**

Gen Chem 2 Exam 1 serves as a critical assessment that gauges students' understanding of advanced chemistry concepts. By focusing on the key topics of chemical equilibrium, thermodynamics, kinetics, and the properties of solutions, and employing effective study strategies, students can enhance their chances of success. With diligent preparation and a positive mindset, students can approach this exam with confidence, paving the way for their continued studies in chemistry.

## **Frequently Asked Questions**

### **What topics are typically covered in the General Chemistry 2 Exam 1?**

General Chemistry 2 Exam 1 usually covers topics such as chemical kinetics, equilibrium, thermodynamics, and solutions.

### **How can I effectively study for the General Chemistry 2 Exam 1?**

To study effectively, review lecture notes, practice problems, use study groups, and take advantage of online resources and quizzes.

### **What are some common types of questions found on the General Chemistry 2 Exam 1?**

Common question types include multiple-choice questions, short answer calculations, and conceptual questions related to the applications of chemical principles.

### **What is the importance of Le Châtelier's principle in chemical equilibrium?**

Le Châtelier's principle helps predict how a change in concentration, temperature, or pressure will affect the position of equilibrium in a reaction.

### **What calculations should I be comfortable with for the**

## General Chemistry 2 Exam 1?

Be comfortable with calculations involving molarity, dilution, equilibrium constants, reaction rates, and thermodynamic properties like enthalpy and entropy.

## How does understanding reaction mechanisms help in General Chemistry 2?

Understanding reaction mechanisms allows students to predict the rate of reactions and how different factors influence reaction pathways and products.

## What resources can I use to prepare for the General Chemistry 2 Exam 1?

Useful resources include textbook practice problems, online tutorials, past exam papers, and study guides specific to your course materials.

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