**CHEMISTRY 2022-23 January 16, 2023**

**Today’s Agenda (Day 88)**

1. HOUSEKEEPING ITEMS

**🡪**  BRING:

1. Homework Check:

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1. Class Activity:

**🡪Launch Lab – Evidence that a Reaction has Taken Place**

**🡪Mini Lab 11 – Apply Stoichiometry**

🡪TUESDAY: Chapter 12 PPT Review

1. Section 12.1 - Gases
2. Section 12.2 – Forces of Attraction
3. Section 12.3 – Liquids and Solids
4. Section 12.4 – Phase Changes

HOMEWORK:

* READ: Chapter 12 – States of Matter
* COMPLETE: Chapter 12 Vocabulary
* STUDY: Chapter12 Vocabulary Quiz and Test

Chapter 12 Vocabulary

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| --- | --- | --- | --- | --- | --- | --- |
| Allotrope | amorphous solid | Atmosphere | Barometer | boiling point | Condensation | crystalline solid |
| Dalton's law of partial pressures | Deposition | Diffusion | dipole-dipole force | dispersion force | elastic collision | Evaporation |
| freezing point | Graham's law of effusion | hydrogen bond | kinetic-molecular theory | melting point | Pascal | phase diagram |
| Pressure | surface tension | Surfactant | Temperature | triple point | unit cell | vapor pressure |
| Vaporization | viscosity |  |  |  |  |  |

REMINDERS:

* QUIZ: **Ch 12 Vocabulary 🡪 Jan. 19**
* TEST: **Ch 12 🡪 Jan. 24**

**CHEMISTRY 2022-23 LAUNCH LAB**

**CHAPTER 11 LAUNCH LAB – What Evidence Can You Observe That a Reaction is Taking Place?**

During a chemical reaction, reactants are consumed as new products are formed. Often, there are several telltale signs that a chemical reaction is taking place.

**Procedure **

1. Read and complete the lab safety form.

2. Use a **10-mL graduated cylinder** to measure out 5.0 mL **0.01M potassium permanganate** (KMnO4). Add the solution to a **100-mL beaker**.

3. Clean and dry the graduated cylinder, and then use it to measure 5.0 mL **0.01M sodium hydrogen sulfite** solution (NaHSO3). Slowly add this solution to the beaker while stirring with a stirring rod. Record your observations.

4. Repeat Step 3 until the (KMnO4) solution in the beaker turns colorless. Stop adding the NaHSO3 solution as soon as you obtain a colorless solution. Record your observations.

**Analysis**

1. Identify the evidence you observed that a chemical reaction was occurring.

2. Explain why slowly adding the NaHSO3 solution while stirring is a better experimental technique than adding 5.0 mL of the solution all at once.

**Inquiry**

Would anything more have happened if you continued to add NaHSO3 solution to the beaker? Explain.

**CHEMISTRY 2022-23 MINI LAB**

**CHAPTER 11 MINI LAB – Apply Stoichiometry**

**How much sodium carbonate (Na2CO3) is produced when baking soda decomposes?**

Baking soda is used in many baking recipes because it makes batter rise, which results in a light and fluffy texture. This occurs because baking soda, sodium hydrogen carbonate (Na2CO3), decomposes upon heating to form carbon dioxide gas according to the following equation.

2 Na2HCO3→ Na2CO3 + CO2 + H2O

**Procedure **

1. Read and complete the lab safety form.

2. Create a data table to record your experimental data and observation.

3. Use a **balance** to measure the mass of a clean, dry **crucible**. Add about 3.0 g of **sodium hydrogen carbonate** (Na2HCO3) and measure the combined mass of the crucible and Na2HCO3. Record both masses in your data table and calculate the mass of the Na2HCO3.

4. Use this starting mass of Na2HCO3and the balanced chemical equation to calculate the mass of Na2HCO3 that will be produced.

5. Set up a **ring stand** with a **ring** and **clay triangle** for heating the crucible.

6. Heat the crucible with a **Bunsen burner**, slowly at first and then with a stronger flame, for 7–8 min. Record your observations during the heating.

7. Turn off the burner and use **crucible tongs** to remove the hot crucible.

**WARNING: Do not touch the hot crucible with your hands.**

8. Allow the crucible to cool, and then measure the mass of the crucible and Na2HCO3.

**Analysis**

1. Describe what you observed during the heating of the baking soda.

2. Compare your calculated mass of Na2HCO3with the actual mass you obtained from the experiment.

3. Calculate Assume that the mass of Na2HCO3that you calculated in Step 4 is the accepted value for the mass of product that will form. Calculate the error and percent error associated with the experimentally measured mass.

4. Identify sources of error in the procedure that led to errors calculated in Question 3.

**CHEMISTRY 2022-23 LAUNCH LAB**

**CHAPTER 12 LAUNCH LAB – How do different liquids affect the speed of a sinking ball bearing?**

You’ve probably noticed that different liquids might have vastly different properties. For example, liquids such as maple syrup, corn oil, and vegetable oil are much thicker than liquids such as water.

**Procedure **

**1.** Read and complete the lab safety form.

**2.** Fill a **100-mL graduated cylinder** with **water.** Be sure to fill it exactly to the 100-mL mark.

**3.** Place the end of a **ruler** on the tabletop. Drop a **ball bearing** (or other small, round object) from a mark onthe ruler just above the surface of the water. Use a **stopwatch** to time the ball bearing as it sinks to thebottom. Record this time in a data table.

**4.** Repeat Steps 2 and 3 two more times, dropping the object from the same height each time. Calculate the average drop time of your three trials.

**5.** Repeat Steps 2–4 using **vegetable oil** instead of water.

**Analysis**

**1. Compare** the average drop time for the two liquids.

**2. Infer** the relationship between the times that you recorded and how easily the liquid flows as you pour it.

**Inquiry**

How does temperature affect the speed with which a ball bearing sinks in a liquid? Develop a hypothesis, and design an experiment to test your hypothesis.

**CHEMISTRY 2022-23 PRACTICE PROBLEM**

**CHAPTER 11 – Stoichiometry**

**Practice Problems 12.1 –** Graham’s Law



**Practice Problems 12.2 –** Partial Pressure of a Gas



**CHEMISTRY 2022-23 CHEM LAB**

