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| CHEMISTRY | CODE: SCS21 |
| 2014-2015 SCHOOL YEAR | INSTRUCTOR: Ms. Bui |
| CLASSROOM: 510 | LAB ROOM: 506 |

**LAB 02**

**QUALITATIVE AND QUANTITATIVE**

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| Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Period: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Subject: Chemistry |

**PRE-LAB:**

Chemistry depends upon both qualitative observations and quantitative measurements. Qualitative observations involve using the senses: seeing, touching, hearing, smelling and tasting. In chemistry lab, do not taste unless otherwise instructed.

Quantitative measurements should be both accurate and precise. The numerical values of these measurements are called data. When making measurement, the numerical values can only be as accurate as the instruments utilized to make the measurement and care and skill as the person performing the measurement.

In this lab, we will be also learning how to use the triple beam balance and the cylinder.

**PURPOSE:**

Make both quantitative and qualitative observations.

**EQUIPMENT and MATERIALS:**

Triple Beam Balance

Graduated Cylinder

Rubber stopper

Cork Stopper

Tap water

Alka Seltzer pill

**PROCEDURE:**

***PART 1: The Triple Beam Balance***

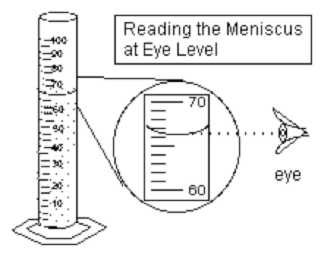
1. The triple beam balance is used to measure \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Before weighing: calibrate the instrument before beginning the measurement.
   * The pan should be empty - move the three sliders on the three beams to their leftmost positions, so that the balance reads zero.
   * If the indicator on the far right is not aligned with the fixed mark, then calibrate the balance by turning the set screw on the left under the pan.
3. Measurement:
   1. place the object to be measured on the pan
   2. Move the 100 gram slider along the beam to the right until the indicator drops below the fixed mark. The notched position immediately to the left of this point indicates the number of hundreds of grams.
   3. Now move the 10 gram slider along the beam to the right until the indicator drops below the fixed mark. The notched position immediately to the left of this point indicates the number of tens of grams.
   4. The beam in front is not notched; the slider can move anywhere along the beam. The boldface numbers on this beam are grams and the tick marks between the boldface numbers indicate tenths of grams.
   5. To find the mass of the object on the pan, simple add the numbers from the three beams.

Questions:

1. What is the maximum capacity of the triple beam balance? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the smallest division that can be read? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. How many decimal places should be included in reporting a measured mass?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***PART 2: The Graduated Cylinder***

1. The graduated cylinder is used to measure \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Graduated cylinders can come in various sizes.
   1. Record your size \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. What is the maximum capacity of your graduated cylinder? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. The graduated lines are every \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. The smallest division is called subgraduate. What is the smallest division of your cylinder? \_\_\_\_\_\_\_\_\_\_\_
   4. How many decimal places should be included in reporting a measured volume? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Read the graduated cylinder by reading the meniscus (the lowest portion of the convex dip of the liquid)
   1. Meniscus form because of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force is stronger than cohesion force



***PART 3: Using the Instruments***

*Record the qualitative observations in the table below*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Object** | **Sight** | **Touch** | **Hear** | **Smell** | **Taste** |
| Rubber stopper |  |  |  |  | N/A |
| Cork stopper |  |  |  |  |  |

***Procedure:***

1. Mass measurements
   1. Place the rubber stopper onto the pan of the triple beam balance and take the mass measurement. After you have completed the measurement and record in the table below, remove the rubber stopper from the pan of the triple beam balance
   2. Place the cork stopper onto the pan of the triple beam balance and take the mass measurement. After you have completed the measurement and record in the table below, remove the cork stopper from the pan of the triple beam balance
2. Volume measurements
   1. Place \_\_\_\_\_\_\_\_\_\_\_\_\_ ml of water into the graduated cylinder and record the volume into the “Before-Volume” column below
   2. Gently place the rubber stopper into the graduated cylinder and record the volume into the “After-Volume” column below
   3. Calculate the difference between the “Before-Volume” column and the “After-Volume” column. Record in the “Water Displaced” column
   4. The “Volume of Object” = “Water Displaced” column. Record in the table.
   5. Repeat the procedure for the cork stopper

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Object** | **Mass (g)** | **Before - Volume (ml)** | **After – Volume (ml)** | **Water Displaced (ml)** | **Volume of object (ml)** | **Density(g/ml)** |
| Rubber stopper |  |  |  |  |  |  |
| Cork stopper |  |  |  |  |  |  |

Density Problem:

1. Write the density equation
2. Calculate the density of the rubber stopper
3. Calculate the density of the cork stopper

***PART 4: Law of Conservation of Mass***

The Law of Conservation of Mass states that in a chemical reaction, the mass of the product equals the mass of the reactants

*Pre-procedure: Record the qualitative observations of the antacid in the table below*

|  |  |
| --- | --- |
| **Description** | **Observations** |
| Sight |  |
| Hear |  |
| Smell |  |
| Touch |  |

Procedures:

1. Place \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ml of water into the zip lock back and seal the bag tightly.
2. Measure the mass of the bag with the water and record in the table below
3. Place a beaker on the pan of the triple beam balance and record the measurement in the table below.
4. Add the antacid into the beaker and record the measurement below.
5. Find the mas of the alka seltzer by subtracting the mass of the beaker from the mass of the beaker and alka seltzer
6. Make a hypothesis about the weight of the zip lock bag with water/alka seltzer and the beaker. Will it stay the same or will it change.
   1. Hypothesis (remember to use the ***If, then, because*** statement)
7. Open the zip lock bag of water and place the alka seltzer into the water. Quickly seal the bag and observe the reaction. Record the observation in the table below
8. Place the zip lock bag into the beaker and record the measurement.

*Post-procedure: Record the qualitative observations and quantitative measurement in the table below*

|  |  |
| --- | --- |
| **Description** | **Observations/Measurements** |
| Mass of zip lock bag and water (g) |  |
| Mass of the beaker |  |
| Mass of the beaker and antacid (g) |  |
| Mass of beaker (g) |  |
| Sight |  |
| Hear |  |
| Smell |  |
| Mass of the beaker, zip lock bag of water and alka seltzer(g) |  |

**Conclusion:**

1. Was your hypothesis correct and why?

**CLEAN THE AREA AROUND YOU. FOLLOW THE INSTRUCTION ON THE BOARD FOR CLEANUP PROCEDURE.**