

Name: _____

Date: _____

ELECTROSTATICS LAB #2
THE ELECTROSTATIC PROPERTIES OF WATER

DETERMINATION OF THE VOLUME OF A WATER DROPLET:

1. Add 5 mL of water to a graduated cylinder and count the number of drops to achieve this.

$$5 \text{ mL} = \underline{\hspace{2cm}} \text{ drops}$$

2. Calculate the number of water droplets per milliliter.

$$\frac{\text{drops}}{5 \text{ mL}} = \underline{\hspace{2cm}} \text{ drops/mL}$$

DETERMINATION OF THE DENSITY OF WATER

1. Record the mass of the dry graduated cylinder
2. Add water to a graduated cylinder
 - a. record the volume
 - b. measure the new mass on the balance
3. Empty the graduated cylinder and repeat 20 times
4. Using Excel plot the mass vs. volume
5. Use a regression line to determine the slope of the graph.
6. Print the graph and record the slope.
7. What does the slope of the graph determine? (aka. What is the rise of the graph? What is the run of the graph?)
8. What is density?
9. What is the density of water?
10. Which substance has a lower density, liquid water or ice? What real-life example demonstrates this difference *qualitatively*?

DETERMINATION OF THE MAXIMUM NUMBER DROPLETS THAT CAN BE HELD ON A PENNY

Place water droplets on the surface of a penny and count the number of drops to achieve this.

CHEMICAL PROPERTIES

Directions: You may use a periodic table to answer the following questions.

1. How many total . . .
 - a. electrons are there in a water molecule?
 - b. protons are there in a water molecule?
 - c. electrons are there in a methane molecule, CH₄?
 - d. protons are there in a water molecule, CH₄?
2. What is the charge of one electron?
3. What is the charge of one proton?
4. What is the total negative charge of water and methane (*in Coulombs*)?
5. What is the total positive charge of water and methane (*in Coulombs*)?
6. What is the electronegativity difference between hydrogen and oxygen?
7. What type of bond has this electronegativity difference?
8. What state of matter is water at room temperature?
9. What is the electronegativity difference between hydrogen and carbon?
10. What type of bond has this electronegativity difference?
11. What state of matter is methane, CH₄, at room temperature?

CONCLUSION QUESTIONS

1. What inherent property of water allows it to attract other water molecules?

2. Why is ice less dense than water? Draw a diagram.