LAB: What's in a Name? & Moles in a Swallow

Students: Please read the following information given below, and then come to class on your lab day with the following already prepared in your notebooks:

1) Date, 2) Partner, 3) Title, 4) Purpose, 5) Materials, 6) Safety, 7) Procedures/Observations, and 8) Data & Calculations (collect data in your notebooks)

The last page needs to be printed out. This page will be turned in. Data for this lab should be collected in your notebooks and later, rewritten in the Data and Calculations section. You must write up your own data table, the space provided on page 2 is not a data table, it is only empty space that I am providing so that you can write in the data table you created along with the calculations. The data and calculations will be due one week after performing the lab in class (your next lab class).

Since the start of civilization, humans have tried to count. The concept of numbers was used to facilitate the counting, used to compare the sizes of groups of objects. Often, names are associated with numbers that people use frequently. Common names such as, unit (1), pair (2), dozen (12), gross (144), and mole, Avogadro's Number (6.02×10^{23}).

Most of us are very familiar with the first four names and numbers, which occur in everyday life. What is the Mole and Avogadro's Number? A mole is the number of objects equal to the number of atoms in 12.0000 grams of carbon. It is also the gram formula mass (gfm) of a substance. That number is equal to Avogadro's Number. How big is this number?

Avogadro's Number is an immense number. If you count out loud starting with the number "one" at the rate of one count every second, it may take you about 1,909,577,942,668,696 years to finish. This is roughly 960,000 times the estimated lifetime of our universe (assuming 20 Billion years).

Using a Pentium 450 MHz CPU, it will still take about 4,243,506 years to finish this task. This is a period of time about a thousand times longer than the total span of our civilization!

Even lab groups will start with Part A, odd lab groups will start with Part B.

Part A: What's in a Name?:
Note: all lab members will complete this part of the lab, and keep a record of your individual data only.
For this part of the lab, the number of moles and formula units of calcium carbonate in the amount of chalk it takes to write your full name (first, middle, and last) will be determined. Obtain a piece of chalk, and mass it. Then write out your full name on the chalkboard. Remass the chalk. Next, calculate the mass of chalk that was used to write your full name. Calculate the number of moles and formula units used in writing your full name. Place all work (nicely organized) in the data section of your notebook. Show all work and units used.

Part B: Moles in a Swallow:
Note: one lab member will complete this part of the lab, but everyone should keep a record of the data.
For this part of the lab, the number of moles and molecules of water in the amount of swallowed water will be determined. Obtain a clean, disposable cup and fill it with clean drinkable water at the eye wash station. Mass the cup of clean water. Take a swallow of water and then reweigh the cup. Calculate the mass of water swallowed. Using the data collected, calculate the number of moles and molecules of water swallowed. Place all work (again nicely organized) in the data section of your notebook.

DO NOT COMPLETE THE FOLLOWING PAGE UNTIL AFTER THE LAB IS COMPLETED AND ALL CALCULATIONS HAVE BEEN ENTERED INTO YOUR NOTEBOOKS FIRST!

CP CHEMISTRY MRS. PITTENGER

Name_____ Date_____

Period_____ Lab Group #_____

Lab: What's in a Name & Moles in a Swallow

Data Table A: What's in a Name?: Enter in your data table and calculations below.

Answer: _____moles of calcium carbonate

Answer: _____formula units of calcium carbonate

Data Table B: Moles in a Swallow: Enter in your data table and calculations below.

Answer: _____moles of water

Answer: _____molecules of water