

Chemistry

Chapter 7 Lab Activity

Weighing as a Means of Counting

Name _____

Name _____

Name _____

Name _____

Purpose: To determine the mass of samples of several different substances and use the data to count atoms.

Materials: sodium chloride
sugar
sodium hydrogen carbonate
water
iron
balance
plastic spoon

Procedure: (Wear your safety goggles.)

Measure the mass of one level teaspoon of each of the substances and record the mass in the following table. Except for the water, return each chemical to its original container when you have recorded its mass.

1 Name of Substance					
2 Formula of Substance					
3 Mass of Sample (g)					
4 Molar Mass of Substance (g)					
5 Number of Moles of Substance (mol)					
6 Representative Particle of Substance					
7 Total Number of Atoms per Representative Particle					
8 Total Number of Atoms in the Sample					

Analysis:

1. Write the name of each substance in Row #1.
2. Write the formula of each substance in Row #2.
3. Record the mass of the sample of each substance in Row #3.
4. Use the formula of the substance and the atomic masses (Periodic Table) of the elements that make up the substance to determine the molar mass of each substance. Record the molar masses in Row #4. (Remember: round off all atomic masses to the nearest tenth before using them in a calculation.)
5. Use the mass of the sample of each sample and its molar mass to determine the number of moles of representative particles of each substance in the sample. Record the number of moles of each substance in Row #5.
6. Write the type of representative particle of each substance in Row #6. (Remember: ionic compounds exist as formula units; molecular compounds exist as molecules; most elements exist as atoms; and some elements exist as diatomic molecules.)
7. Write the total number of atoms per representative particle in Row #7.
8. Use the number of moles of each sample and the number of atoms in a representative particle of the substance to determine the total number of atoms in the sample of that substance. Record the total number of atoms in Row #8.

Questions:

1. Which substance had the greatest mass per teaspoon? _____.
2. Which substance had the greatest number of moles per teaspoon? _____.
3. Which substance had the greatest number of atoms per teaspoon? _____.

$$\# \text{ moles} = \frac{\text{mass of substance (g)} | 1 \text{ mol substance}}{\text{molar mass of substance (g)}} =$$

$$\text{Total \# atoms} = \frac{\text{moles of substance} | 6.02 \times 10^{23} \text{ rep. part}}{1 \text{ mol substance}} | \frac{\text{total \# of atoms per rep. part.}}{1 \text{ rep. part. of substance}} =$$