**Lab: The Mass of a Mole**

**Purpose:** To become familiar with a mole of different substances.

**Safety, Handling and Disposal**: *Do Not Open any Container. Return all containers to the teacher.*

**Materials:** Containers containing one mole of substances

**Procedure**

1. Record the name and formula of substance in the data table.
2. Calculate the molar mass of the substance in the space provided for a comparison
3. Use the balance to find the mass of the substance plus the container.
4. Record in table
5. Subtract the mass of the container and determine the mass of one mole of the substance.
6. Repeat for all five known substances
7. Get an unknown sample from your teacher. Given the identity of your unknown, your job is to determine how many moles your sample contains.

**Data**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name of Substance** | **Formula** | **Calculated Molar Mass, grams/mole** | **Mass of the substance + container, g** | **Mass of container, g** | **Measured Mass of substance** |
| 1. |  |  |  | 12 |  |
| 2. |  |  |  | 12 |  |
| 3. |  |  |  | 12 |  |
| 4. |  |  |  | 12 |  |
| 5. |  |  |  | 12 |  |
| 6. Unknown #\_\_\_\_\_ |  |  |  | 12 |  |

**Calculation of Molar Mass *– Show your work here for calculations of molar mass.***

Formula of 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Formula of 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Formula of 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Formula of 4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Formula of 5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Analysis and Questions**

1. Unknown Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Unknown #\_\_\_\_\_ Measured Mass \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use the measured mass and the calculated molar mass as a conversion factor to determine how many moles are in your unknown sample. *Show your work!*

1. How did your calculated molar masses compare to your measured molar masses?
2. If you were given 259 grams of salicylic acid how many moles would you have?
3. If you were given 534 grams of sodium chloride how many moles would you have?
4. If you were told to measure out 1.1 moles of sodium carbonate how many grams would you need?
5. If you were told to measure out 25 moles of calcium chloride how many grams would you need?