**POPCORN LAB: PERCENT COMPOSITION ALTERNATIVE ASSIGNMENT**

**Use the data below to complete the lab-specific calculations.**

**PURPOSE:** When popcorn is heated, the water trapped inside the kernel expands until the skin of the kernel explodes. Our job is to determine the percent composition (also known as mass %) of water in microwave popcorn.

**MATERIALS:** balance, microwave, bag of microwave popcorn, calculator

**PROCEDURE:**

1. Take the popcorn out of the plastic wrapper and place on the scale. Record the mass in the table below to the appropriate significant figure.
2. Cook the popcorn in the microwave: listen to your popcorn carefully so you don't burn the popcorn.
3. Open the bag and let the steam escape. (This is the water that was trapped in the kernel.)
4. Place the bag of cooked popcorn on the scale and record the mass to the appropriate significant figure in the table below.
5. Calculate the difference between the mass of the popped popcorn and the mass of the unpopped kernels and record in table below.

**DATA TABLE:**

| | |
|---|---|
| Mass of unpopped popcorn | 65.302 g |
| Mass of popped popcorn | -58.551 g |
| Mass of water | = |
| Percent of water in popcorn | |

Calculate the percentage mass lost by using the following formula:

**Percent mass lost(% water) = $\frac{\text{original mass (step 1) – final mass (step 4)}}{\text{Original mass}}$ x 100**

**CONCLUSION/ANALYSIS:**

1. Calculate the percent composition of water, when there is 45.87g of $H_2$ and 187.67g of $O_2$.
2. What is the percent composition of all elements in magnesium sulfate, $MgSO_4$?
3. What is the percent composition of all elements in sodium bromide, NaBr?
4. What is the percent composition of all elements in ammonium carbonite, $(NH_4)CO_2$?
5. Calculate the percent composition of aluminum hydrogen sulfate, $Al_2(HSO_4)_3$when there is 35.87g of Al, 134.76g of H, 167.32g of S, and 232.39g of O.

6. Take the mass of the popcorn **BEFORE** popping and find the number of:
   a. Moles in the popcorn. Note: 1 mole popcorn = 79g.
   b. Molecules in the popcorn.
7. Take the mass of the popcorn **AFTER** popping and find the number of:
   a. Moles in the popcorn.
   b. Molecules in the popcorn

REMEMBER: There are 2 ways to calculate percent composition.

1) if actual sample masses are given, use them. (Q#1, 5)

$$\frac{\text{Actual mass of element}}{\text{Total mass of compound}} \times 100$$

2) If no masses are given, use the formula to calculate molar mass, and % composition from there. Uz5e5(Q#2-4)

$$\frac{\text{Mass of element in 1 mole compound}}{\text{Molar mass of compound}} \times 100$$