**MOLE REVIEW**

1. A teaspoon of salt, NaCl has a mass of about 5.0 g. How many formula units are in a teaspoon of salt?
2. Calculate the molar mass of acetic acid, CH3COOH.
3. How many molecules are present in 6.79 g of 3-aminophthalhydrazide (Luminol®), C8H7O2N3?
4. Find the molar mass of cobalt(II) sulfate heptahydrate.
5. Ethylene glycol is a major ingredient in many antifreeze formulas, such as Prestone® and Zerex®. Its formula is HOCH2CH2OH. What is its % composition?
6. What is the percent composition of anhydrous aluminum nitrate?
7. A gold coin contains 3.47 × 1023 gold atoms.What is the mass of the coin in grams?
8. Tetrachloroethane is a valuable nonflammable solvent. Its percent composition is 14.31% carbon, 1.20% hydrogen, and 84.49% chlorine. What is the empirical formula of this compound?
9. Butyric acid is an odd compound – it smells like “baby spit-up,” but it can be reacted with ethyl alcohol to make artificial pineapple fragrance (ethyl butyrate). Butyric acid’s percent composition is 54.53% carbon, 9.15% hydrogen, and 36.32% oxygen. Calculate its empirical formula.
10. Determine the empirical formula for a compound with the following elemental composition:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| %  |  % 🡪 grams | grams 🡪 moles |  divide by smallest | return to whole |
| 40.00% C |  |  |  |  |
| 6.72% H |  |  |  |  |
| 53.29% O |  |  |  |  |

Suppose we know that the molecular weight of this compound is 180 g/mol. Find the Molecular formula.

1. Cyclohexane is 85.63% carbon and 14.37% hydrogen and has a molar mass of **84.16 g/mol**. What is its molecular formula?
2. Adenine is a component of DNA and RNA. Its composition is 44.44% carbon, 3.73% hydrogen, and 51.83% nitrogen; its molar mass is **135.13 g/mol**. What is its molecular formula?
3. Calculate the number of representative particles in each of the following quantities. Round all answers to three significant figures.
4. 2.35 mol N2­­­­­­­
5. 0.993 mol CH2Cl2
6. 38.4 mol Ag
7. Calculate the mass of each of the following quantities. Round all answers to three significant figures.
8. 0.00144 mol Hg
9. 5.00 mol H2O
10. 9.15x104 mol NaNO3
11. Calculate the number of moles in each of the following quantities. Round all answers to three significant figures.
12. 0.500 grams of CH3COOH
13. 2.95x1024 atoms of carbon
14. 12.3 grams of water
15. 330. grams of lithium fluoride
16. Calculate the percentage composition of the following compounds.
17. CaCO3
18. BrF3
19. MgCl2 6H2O
20. How many grams of iron could be obtained from 445 grams of Fe(NO3)3 9H2O?
21. Chloroform was once used as an anesthetic until its toxic properties were discovered. The percentage composition of chloroform is:

10.061% carbon

0.84436% hydrogen

89.094% chlorine

 What is the empirical formula of chloroform?

1. Glyceraldehyde is a molecule produced during cellular respiration. Its empirical formula is CH2O and it has a molar mass of 90.09 g/mol. What is the molecular formula of glyceraldehyde?