

## Honors Chemistry Prac-Test: The Mole and Formulas

1. Write the correct answer in the space. (17 pts.)
- \_\_\_\_\_ A flask contains  $2.5 \times 10^{22}$  molecules of  $C_5H_{10}O_2$  gas. How many atoms of C are present in this flask?
  - \_\_\_\_\_ 0.0721 moles of a compound have a mass of 31.008 grams. What is the molar mass?
  - \_\_\_\_\_ A compound has an empirical formula of  $C_{17}H_{30}N_3$  and an approximate molecular mass of 2200 g/mol. What is the molecular formula of the compound?
  - \_\_\_\_\_ How many moles of O atoms are contained in 1 mole of vanilla,  $C_8H_8O_3$ , molecules,?
  - \_\_\_\_\_ An alkali metal forms a sulfide compound that has molar mass of 45.8 g/mol. What is the alkali metal?
2. Mole Conversions: See Worksheet and Practice Test questions on earlier handout.
- A 50.0 Liter tank of a solution contains an impurity,  $C_{11}H_{17}N_3S$ , at a level of 3.47%. A chemist dispenses 1.181 liters of this solution. How many molecules of  $C_{11}H_{17}N_3S$ , are in this dispensed solution?
3. Empirical and Molecular Formulas. See worksheet
- Calculate the percent composition and empirical formula of a rhodium chloride compound combined in the ratio 1.00: 1.03 by mass

### Answers:

1. Write the correct answer in the space.
- $1.25 \times 10^{23}$  A flask contains  $2.5 \times 10^{22}$  molecules of  $C_5H_{10}O_2$  gas. How many atoms of C are present in this flask?
  430. g/mol 0.0721 moles of a compound have a mass of 31.008 grams. What is the molar mass?
  - $C_{136}H_{240}N_{24}$  A compound has an empirical formula of  $C_{17}H_{30}N_3$  and an approximate molecular mass of 2200 g/mol. What is the molecular formula of the compound?
  - 3 moles How many moles of O atoms are contained in 1 mole of vanilla,  $C_8H_8O_3$ , molecules,?
  - 6.9 g/mol = Li An alkali metal forms a sulfide compound that has molar mass of 45.8 g/mol. What is the alkali metal?
2. Mole Conversions: See Worksheet and Practice Test questions on earlier handout.
- A 50.0 Liter tank of a solution contains an impurity,  $C_{11}H_{17}N_3S$ , at a level of 3.47%. A chemist dispenses 1.181 liters of this solution. How many molecules of  $C_{11}H_{17}N_3S$ , are in this dispensed solution?  
**Solution has same properties as water, so 1L=1kg=1000g (Density  $H_2O = 1g/ml$ )**  
 **$0.0347 \times 1.181 \times 10^3 \text{ g} = 41.0 \text{ grams, } 41.0 \text{ grams}/223 \text{ g/mol} \times 6.02 \times 10^{23} = 1.11 \times 10^{23} \text{ molecules}$**
3. Empirical and Molecular Formulas. See worksheet
- Calculate the percent composition and empirical formula of a rhodium chloride compound combined in the ratio 1.00: 1.03 by mass **Mass: Rh 50.0% Cl 50.0%, Empirical formula:  $RhCl_3$**