

## C1401 tutorial 3

1. Determine
  - a. The mass of 0.357 mol of gold
  - b. The number of atoms of 0.357g of gold
  - c. The mass of  $1.27 \times 10^{40}$  particles of palladium
2. Acetylsalicylic acid (ASA),  $C_9H_8O_4$  is the active ingredient of aspirin.
  - a. What is the mass in grams of 0.59 mol of ASA?
  - b. A one-gram sample of aspirin contains 75.2 % of ASA. How many moles of ASA are in the sample?
  - c. How many molecules and carbon atoms are there in 12.00 g of ASA?
3. Consider Arsenic, a favourite a poison used in crime stories. Calculate.
  - a. The mass of an Arsenic atom
  - b. The number of atoms in 10.00 g sample of Arsenic
  - c. The number of protons in 0.1500 lb of Arsenic (1 lb = 453.6g)
4. Complete the following table for citric acid,  $C_6H_8O_7$ , the acid found in many citrus fruits.

Mass in grams	Number of mole	Number of molecules	Number of O atoms
0.1364			
	1.248		
		$4.32 \times 10^{22}$	
			$5.55 \times 10^{19}$

5. How many moles of sulphur molecules are contained in 80.0g of sulphur if the molecular formula is  $S_8$ ?
6. The recommended daily limit of dietary allowance of vitamin C,  $C_6H_8O_6$ , for a first year Bsc female student of an average weight is  $4.6 \times 10^{-4}$  mol. What is this allowance in grams?
7. How many moles of nitrogen atoms are contained in 9.34 g of nitrogen?
8. The principal component of natural gas is methane. A sample of methane contains 0.090 mol carbon and 0.360 mol hydrogen. What is the empirical formula?
9. A sample of mineral hematite, an oxide of iron, found in iron ores, contains 34.97 g of iron and 15.03 g of oxygen. What is the empirical formula of hematite?
10. A pure oxygen is sometimes prepared in the chemistry laboratory by heating compound containing potassium K, chlorine Cl and oxygen O. what is the empirical formula of this compound, if a 3.22 g sample decompose to give gaseous oxygen and 1.96 g of potassium chloride.
11. Which of the following statement is/are **True** or **False**.
  - a. Compound containing chlorine can be either molecular or ionic.
  - b. An ionic compound has at least one metal.
  - c. When an element in a molecule has a "di-" prefix means that the element has a charge of +2.