Practice Test #2 Chapter 7B

1. Cinnabar, an ore of mercury, has the formula HgS. Calculate the number of moles in a one kg bar of cinnabar.

(ans. 4.30 moles)

2. Analysis: Potassium 24.5 8%; manganese 34.81%; oxygen 40.50%, What is the empirical formula?

(ans. KMnO4)

3. A compound contains carbon, 81.7%, and hydrogen, 18.3%. Find the empirical formula. (ans. C3H8)

4. What mass of calcium phosphate (Ca3(P04)2) would contain the same number of moles as 50.0 grams of lead II nitrate

Pb(N03)2? (Ans. 46.8 g)

5. Symclosene, a disinfectant used in household cleaners, has an empirical formula of CClNO and a molecular mass of

232.42 u. What is the molecular formula of symclosene? (ans. C3Cl3N303)

6. How many molecules of sulfur dioxide are present in 1.60 moles of sulfur dioxide. (ans. 9.63 Xl 023)

7. Determine the molar mass of aluminum oxide. (ans. 101.96 grams)

8. What is the percentage composition of a sulfur-chlorine compound, given that a 30.9 gram sample of the compound is found to

contain 9.63 grams of sulfur and 21.3 grams of chorine? (ans. (Sulfur 31.17% and Chlorine 68.93%)

9. An oxide of phosphorus is found to contain 43.5% phosphorus and 56.5% oxygen. If its formula mass is 284.0 units, find its

molecular formula (ans. P4010)

10. How many molecules is contained in 12.00 grams of NaOH? (ans. 1.807 X 1023)

11. How many milligrams would an aspirin tablet (C9H804) contain if it had 3.342 Xl 020 molecules of aspirin?

( ans. 99.99 mg)

12. How many moles of aspirin would the same tablet mentioned in the previous question contain? (ans. 5.54 XlO4mol)

13. Ibuprofen, the active ingredients in many nonprescription pain relievers, has the molecular formula C13H1802. The molar

mass of ibuprofen is 206.2860 g/mol. If the tablets in a bottle contain 33 grams of ibuprofen, how many moles of

ibuprofen are in the bottle? (ans. 0.16 moles)

14. To carry out a reaction you need 3.20 moles of zinc nitrate Zn(N03)2. What is the mass of this sample?

(ans.606.04 grams)

15. Phenylalanine is an essential amino acid whose chemical composition is 65.5 % carbon; 6.67% hydrogen;

8.48% nitrogen; and 19.4% oxygen. What is the empirical formula for phenylalanine? (ans. C9H11N02)

16. Beta-carotene, a compound found in carrots, can be broken down to form vitamin A. The empirical formula for

betacarotene is C5H7. The molar mass of beta carotene is 536 g/mol. What is the molecular formula for beta carotene?

(ans. C40H56)

17. How many molecules of carbon tetrachloride are present in a 2.40 mole sample? (ans. 1.44 Xl 024 molecules)

18. Determine the molar mass of barium chloride. (ans. 208.23 g)

19. A sample of an unknown compound with a mass of 0.2370 grams is extracted from the roots of a plant. Decomposition

of the sample produces 0.09480 grams of carbon, 0.1264 grams of oxygen, and 0.0158 grams of hydrogen. What is the

percentage composition of the compound? (ans. 40% carbon, 6.6 % hydrogen, and 53% oxygen)

20. Laughing gas is sometimes used as an anesthetic in dental work. How many moles of laughing gas are present .in a

sample that contains 8.46 X1026 molecules? (ans. 1.405 X103 moles)

21. Ribose is an important sugar that is found in RNA. Ribose has a molar mass of 150 g/mol and a chemical composition

of 40.0 % carbon, 6.67% hydrogen, and 53.3% oxygen. What is the molecular formula for ribose? (ans. CH10O5)

22. An extra strength tablet contains 500 mg of aspirin (C9H8O4). How many molecules of aspirin are in one extra strength tablet?

(ans. 1 .67X 1021 molecules)

23. Which has the greatest mass, 2.1 moles of Br2 or 1.86 X 1022 molecules of CCl4I? ans. 335.59 grams Br2)

24. Some rocket engines use a mixture of hydrazine (N2H4) and hydrogen peroxide (H202) as a propellant system. If 0.25 moles of

hydrazine is required to react with 0.50 moles of hydrogen peroxide, how many grams of each substance would be needed?

(ans. 8 g. hydrazine and 17 g hydrogen peroxide)