UNIVERSITY OF BAHRAIN
CHEMISTRY 101
FIRST HOUR EXAMINATION

16th July, 2005

***Examiners*: Drs.M. Al-Arab, A. Saad, Saeed & A. Taha**

Time : *70 min.*

Name _____ I.D. # _____ Sec._____

*Circle the letter of the one correct answer. A double page of foolscap paper is provided for calculations but only the circled answers on this exam copy will be graded. Each question is worth one(1) point. Check that your paper has **(13)** questions.*

N = 6.022 x 10^{23}

MULTIPLE CHOICE :

Q.1. The ionic compound formed between Na and O is :

a. NaO b. Na_2O c. NaO_2 d. Na_2O_2 e. Na_3O

Q.2. Which group of three elements contains a non-metal, a metal and a metalloid respectively?

a. As, P, Cr b. N, S, As c. As, Cr, N d. N, Cr, As e. Cr, As, N

Q.3. The total number of protons, neutrons and electrons in $^{57}Co^{3+}$ is :

a. 57 b. 27 c. 30 d. 81 e. 24

Q.4. The name of $Fe(NO_2)_2$ is :

a. Iron nitrate
b. Iron nitrite
c. Iron (II) nitrite
d. Iron (III) nitrite
e. Iron (II) nitrate

Q.5. The formula of phosphorous pentachloride :

a. PCl_5 b. P_2Cl_3 c. PCl_3 d. P_2Cl_5 e. PCl

Q.6. Naturally, occuring Ga is composed of ^{69}Ga which has an atomic mass of 68.91 amu and of ^{71}Ga which has an atomic mass of 70.93. What is the percent of ^{71}Ga abundance.

a. 30.40 % b. 40.09 % c. 59.91 % d. 60.94 % e. 70.32 %

Q.7. If there are 3.84×10^{24} atoms of oxygen in Na_2SO_4. what is the mass of Na_2SO_4.

a. 154 gram b. 358 gram c. 226 gram d. 58 gram e. 480 gram

Q.8. What is the number of moles of oxygen (O) in 45.85 grams of $Mg_3(PO_4)_2$.

a. 0.52 moles of O b. 1.65 moles of O c. 2.53 moles of O
d. 1.39 moles of O e. 0.82 moles of O

Q.9. A 1.00 gram sample of a compound containing the elements: C, H, O is burned completely and converted to 2.20 g CO_2 and 1.20 g H_2O. What is its **empirical (simplest) formula?**

a. C_2H_6O b. C_2H_5O c. C_3H_8O d. $C_2H_2O_4$ e. $C_4H_{10}O$

Q.10 How many milligrams (mg) of "Pt" are present in 250 mg of Pt $(NH_3)_2\ Cl_2$?

a. 181.5 mg b. 162.8 mg c. 85.3 mg d. 130.1 mg e. 81.6 mg

Q.11 Consider the following equation:

$$\_\_\_\_\ \mathbf{C_6H_{14(\,l\,)}} + \_\_\_\_\ \mathbf{O_{2(g)}} \rightarrow \_\_\_\_\ \mathbf{CO_{2(g)}} + \_\_\_\_\ \mathbf{H_2O_{(g)}}$$

When the equation is properly balanced the numbers that fill the four blanks are :

a. 1, 19, 6, 7 b. 1, 19, 2, 14 c. 2, 19, 6, 7
d. 2, 19, 12, 14 e. 12, 14, 1, 19

Q.12 Consider the following reaction :

$$\mathbf{2NH_{3(g)} + CO_{2(g)} \rightarrow (NH_2)_2CO_{(aq)} + H_2O_{(l)}}$$

Determine the limiting reactant and the theoritical yield of $(NH_4)_2CO$ if we start with 637.2 g of NH_3 and 1142 g of CO_2.

a. NH_3; 1124 g b. NH_3; 1142 g
c. CO_2 ; 869 g d. CO_2; 1124 g
e. NH_3 ; 869 g

Q.13 Given the following equation :

$$\mathbf{N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)}}$$

13.80 moles of hydrogen react with excess of nitrogen. If 132 g of NH_3 was obtained. What is the percentage yield of the reaction?

a. 17.5 % b. 25.8 % c. 38.6 % d. 84.4 % e. 78.7 %