Chemistry 101
First Exam (122)

Name:_____ **Date: 18/03/2013**

Student no. _____ **Section:**_____

Useful Information: *Avogadro's number = 6.02 x 10^{23}*

H[1] 1.000																	**He**[2] 4
Li[3] 6.941	**Be**[4] 9.012											**B**[5] 10.81	**C**[6] 12.01	**N**[7] 14.01	**O**[8] 16	**F**[9] 19	**Ne**[10] 20.18
Na[11] 22.99	**Mg**[12] 24.31											**Al**[13] 26.98	**Si**[14] 28.09	**P**[15] 30.97	**S**[16] 32.06	**Cl**[17] 35.45	**Ar**[18] 39.95
K[19] 39.10	**Ca**[20] 40.08	**Sc**[21] 44.96	**Ti**[22] 47.9	**V**[23] 50.94	**Cr**[24] 51.99	**Mn**[25] 54.94	**Fe**[26] 55.85	**Co**[27] 58.93	**Ni**[28] 58.71	**Cu**[29] 63.54	**Zn**[30] 65.37	**Ga**[31] 69.72	**Ge**[32] 72.59	**As**[33] 74.92	**Se**[34] 78.96	**Br**[35] 79.9	**Kr**[36] 83.8
Rb[37] 85.47	**Sr**[38] 87.62	**Y**[39] 88.91	**Zr**[40] 91.22	**Nb**[41] 92.91	**Mo**[42] 95.94	**Tc**[43] 99.91	**Ru**[44] 101.1	**Rh**[45] 102.91	**Pd**[46] 106.4	**Ag**[47] 107.87	**Cd**[48] 112.4	**In**[49] 114.8	**Sn**[50] 118.69	**Sb**[51] 121.75	**Te**[52] 127.6	**I**[53] 126.9	**Xe**[54] 131.3
Cs[55] 132.9	**Ba**[56] 137.3	**57-71** *	**Hf**[72] 178.5	**Ta**[73] 180.9	**W**[74] 183.85	**Re**[75] 186.2	**Os**[76] 190.2	**Ir**[77] 192.2	**Pt**[78] 195.1	**Au**[79] 196.97	**Hg**[80] 200.6	**Tl**[81] 204.37	**Pb**[82] 207.2	**Bi**[83] 208.98	**Po**[84] 210	**At**[85] 210	**Rn**[86] 222

Write the best fit answer of the following questions in this table:

Q1 ***(1 pt)***	**Q2** ***(1 pt)***	**Q3** ***(1 pt)***	**Q4** ***(0.75 pt)***	**Q5** ***(1.25pt)***	**Q6** ***(0.75 pt)***	**Q7** ***(1.0 pt)***	**Q8** ***(2.0pt)***
Q9 ***(0.75pt)***	**Q10** ***(0.75 pt)***	**Q11** ***(0.75 pt)***	**Q12** ***(1.5 pt)***	**Q13** ***(1.5 pt)***	***Total (13)***		

1) When 10.0 g of marble (Calcium Carbonate) is treated with 0.05 L of HCl (density = 1.096 g/mL), the marble dissolves giving a solution and releasing CO_2 gas. If the solution weighs 60.4 g. What is the volume in liters of CO_2 gas released (density of gas = 1.798 g/L)

A. 4.8 L B. 2.4 L C. 0.4 L D. 2400 L

2) Assuming all numbers are measured quantities, do the indicated arithmetic and give the answer to the correct number of significant figures.
(934.0 x 0.00481) + 107 =?

A. 111 B. 112 C. 111.49 D. 111.5

3) Lead metal is produced by heating solid lead (II) sulfide with solid lead (II) sulfate, to produce liquid lead and sulfur dioxide gas. Write a complete balanced equation for this reaction……
……..

4) One isotope of an element has mass number 74 and has 51 neutrons in the nucleolus. The atomic ion of this element has 18 electrons. The symbol for this ion is:

A. V^{5-} B. Na^{+} C. As^{5+} D. V^{5+}

5) Give an example for each of the following:
- A noble gas in the sixth period……
- A metalloid in group IV A……
- A molecular element…….
- A Molecular compound…….
- An ionic compound composes of a metal in the second period with a halogen whose anion contains 36 electrons……...

6) Malonic acid is an organic compound which has the formula of ($C_3H_4O_4$). The sum of all coefficients (reactants and products) of the balanced chemical equation which represents the combustion of Malonic acid is:

A. 6 B. 7 C. 8 D. 9

7) A sample of hydrated magnesium sulfate ($MgSO_4 \bullet xH_2O$) was heated to derive the water off. If 3.78 g of water (all water) and 3.60 g of anhydrous magnesium sulfate were obtained after heating. The formula of hydrated magnesium sulfate is:

A. $MgSO_4 \bullet 6H_2O$ B. $MgSO_4 \bullet 5H_2O$ C. $MgSO_4 \bullet 2H_2O$ D. $MgSO_4 \bullet 3H_2O$

8) Fill in the blank::

- The name of CaO_2 is……
- The formula of triammonium phosphate is……..
- The name of Hg_3N_2 is……..……
- The formula of magnesium perchlorate hexahydrate is……

9) Which of the following compounds has the lowest percentage of sulfur (S):

A. $CaSO_4$ B. SO_2 C. H_2S D. $Na_2S_2O_3$

10) The mass of zinc (Zn) that can be theoretically obtained from 300 g of an impure ore that contains 60% ZnS is:

A. 1.85 g B. 3.1 g C. 120.8 g D. 3.1 g

11) The number of oxygen molecules in 171 g of aluminum sulfate is:

A. 3.6×10^{24} B. 1.8×10^{24} C. 1.2×10^{24} D. 9.0×10^{23}

12) A 0.630 g sample of a compound of molybdenum (Mo) and sulfur (S) underwent a series of reactions in which all the sulfur was converted to $BaSO_4$. A total of 1.839 g of $BaSO_4$ was obtained. What is the empirical formula of the molybdenum compound?

A. Mo_3S_2 B. Mo_3S_4 C. Mo_3S D. MoS_2

13) Disulfide dichloride (S_2Cl_2) is prepared by heating sulfur in atmosphere of chlorine:

$$S_{8(l)} + 4\,Cl_{2(g)} \longrightarrow 4\,S_2Cl_{2\,(l)}$$

If 4.06 g of S_8 is heated with 6.24 g of Cl_2 to produce 6.55 g of S_2Cl_2. Calculate the percentage yield of the reaction:

A. 77.1 % B. 55.2 % C. 34.2 D. 47.8 %

-Good Luck-