CHEMISTRY 101
SECOND EXAM

Name:_____ **Date: 06/05/2013**

Student no. _____ **Section:**_____

Useful Information: *Gas Constant R= 0.08206 L.atm/K.mol, Specific heat of H_2O=4.18 J/g. °C*

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	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Q9	**Q10**	**Q11**	**Q12**	**Q13**	**Q14**	**Total (13)**	

1. The mass (in grams) of NaOH required to prepare 4.0×10^2 mL of 0.6 M NaOH solution is:

a) 0.65 b) 11.25 c) 4.75 d) 9.60

2. When 200 mL of 0.30 M $AgNO_3$ and 300 mL of 0.30 M KI are mixed the following reaction occurs:

$$AgNO_{3(aq)} + KI_{(aq)} \longrightarrow AgI_{(s)} + KNO_{3(aq)}$$

The concentration of NO_3^- in the final solution is:

a) 0.20 M b) 0.18 M c) 0.12 M d) 0.15 M

3. In the following half reaction:

$$C_2O_4^{2-} \longrightarrow 2\ CO_2$$

One of the following descriptions is correct:

a) No electrons are lost or gained.
b) Two electrons are gained.
c) Two electrons are lost.
d) Only one electron is lost.

4. Calculate ΔH for the reaction:

$$\boldsymbol{2Al_{(s)} + Fe_2O_{3(S)} \longrightarrow 2\ Fe_{(s)} + Al_2O_{3(s)}}$$

Given the following reactions and their respective enthalpy changes:

	ΔH/kJ
$^1/_2\ Al_2O_{3(s)} \longrightarrow Al_{(s)} + {}^3/_4\ O_{2(g)}$	+834.9
$4\ Fe_{(s)} + 3\ O_{2(g)} \longrightarrow 2\ Fe_2O_{3(S)}$	-1644.4

a) 810 kJ b) 847.6 kJ c) 2492 kJ d) -847.6 kJ

5. Complete the following reactions then write the ***IONIC*** and the ***NET IONIC*** equation for each of them:

a) $K_3PO_{4(aq)} + 3\ Sr(NO_3)_{2(aq)} \rightarrow$…….
Ionic:.....
Net Ionic:……..

b) $HCl_{(aq)} + NH_4OH_{(aq)} \rightarrow$ ……
Ionic:……...
Net Ionic:……

6. How many milliliters of 0.15 M H_2SO_4 are required to neutralize 8.20 g of $NaHCO_3$, according to the following equation:

$$H_2SO_{4\,(aq)} + 2\ NaHCO_{3\,(aq)} \longrightarrow Na_2SO_{4(aq)} + 2\ H_2O_{(aq)}$$

a) 162.5 mL b) 325 mL c) 650 mL d) 32.5 mL

7. If 1625 J are obtained from 75 g of ethanol initially at 25 ºC. Calculate the final temperature of ethanol, given that the specific heat of ethanol is 2.4 J/g. ºC.

a) 9 ºC b) 25 ºC c) 16 ºC d) -9 ºC

8. Ammonia, NH_3, burns according to the following equation:

$$4\ NH_{3(g)} + 3\ O_{2(g)} \longrightarrow 2\ N_{2(g)} + 6\ H_2O_{(g)} \quad \mathbf{\Delta H = -1267\ KJ/mol}$$

What is the enthalpy change **(ΔH)** released by burning 35.8 g of ammonia (NH_3).

a) 667 KJ b) 2668 KJ c) -2668 KJ d) -667 KJ

9. A student mixes 88.6 g of a liquid at 74.3 ºC with 57.9 g of the same liquid at 24.8 ºC in an insulated flask. What is the final temperature of the combined liquid?

a) 54.7ºC b) 167.7 ºC c) 35.13 ºC d) 67.7 ºC

10. The pressure at which 0.25 mole of $N_2(g)$ occupy $1x10^4$ mL at 100 ºC will be:

a) 2.05 atm b) 0.765 atm c) 0.205 atm d) 7.65 atm

11. The mass of KO_2 ***in kg*** that produces 1000 L O_2 at **STP** from the following equation is:

$$\boldsymbol{4\ KO_2 + 2\ CO_2 \rightarrow 2\ K_2CO_3 + 3O_{2(g)}}$$

a) 8.45 b) 44.64 c) 3.17 d) 4.23

12. If the density of a noble gas equals $1x10^{3-}$ g/mL at -5 ºC and a pressure of 418 torr, then this noble gas is:

a) Ne b) Ar c) Kr d) Xe

13. A 50 mL sample of oxygen gas at 25 ºC and 120 torr and a 100 mL sample of nitrogen at 25 ºC and 160 torr are both placed in 200 mL flask at 25 ºC. What is the final pressure in the flask? NO REACTION OCCURES

a) 110 torr b) 250 torr c) 280 torr d) 800 torr

14. If an equal masses of $O_2(g)$ and HBr(g) present in separate containers of equal volume and temperature, which one of the following statements is true?

a) The pressure in the O_2 container is greater than that in HBr container.

b) The pressure in the HBr container is greater than that in O_2 container.

c) The pressure of both gases are the same.

d) None of the above.

-GOOD LUCK-