General Chemistry Lab. 109
Mid-Term Exam

Date: 26/11/2008
Time: 75 min.

Name: …….. Reg. No.: ……...

Instructor Name: …… Section : ……..

ANSWER SHEET

1.	a	b	c	d	e	9.	a	b	c	d	e
2.	a	b	c	d	e	10.	a	b	c	d	e
3.	a	b	c	d	e	11.	a	b	c	d	e
4.	a	b	c	d	e	12.	a	b	c	d	e
5.	a	b	c	d	e	13.	a	b	c	d	e
6.	a	b	c	d	e	14.	a	b	c	d	e
7.	a	b	c	d	e	15.	a	b	c	d	e
8.	a	b	c	d	e	16.	a	b	c	d	e

GOOD LUCK

Answer each of the following questions and put "X" on the correct choice on the front page.

1. Which of the following statements is **not correct** concerning lab safety rules?

   a) Dispose of all waste in an appropriate manner: Many chemicals need to be disposed off in special containers found in the fume hoods; solids should not be thrown into the sink.
   b) Shared chemicals should not be removed from their original locations.
   c) To avoid chemical loss, unused chemicals should be returned to the stock bottles.
   d) Long hair should be tied back during lab periods.
   e) Every chemical in the lab should be treated as if it was hazardous.

2. A student obtained the following set of data on density measurements of a solid:

   - Mass of empty beaker = 84.35 g
   - Mass of beaker + metal pieces = 98.25 g
   - Initial water level in the graduated cylinder = 55.0 mL
   - Final water level in the graduated cylinder with the metal pieces = 57.3 mL.

   The density (g/cm^3) of the solid is:

   a) 6.043 b) 6.0 c) 6.04 d) 6 e) 6.0435

3. The density of platinum is 21.5 g/mL and the density of silver is 10.5 g/mL. Given that equal masses of silver and platinum were transferred into two separate but identical graduated cylinders having the same volume of water, which of the following observations is **correct** (about the final water level)?

   a) Both cylinders will have the same water level.
   b) The cylinder which contains platinum will have the higher water level.
   c) The set of data are not enough to determine which cylinder would have higher water level.
   d) The cylinder which contains silver will have the higher water level.
   e) None of the above.

4. Given the following set of data for the determination of water of hydration for a certain alum.
   - Mass of empty crucible = 14.35 g
   - Mass of crucible + alum = 15.48 g
   - Mass of crucible + anhydrous alum = 15.02 g
   - Molar masses (g/mol) for H_2O: 18.0 and for anhydrous salt: 287.

   The value of "x" for water would be:

   a) 13 b) 14 c) 11 d) 15 e) 12

5. Which of the following statements is **correct** concerning the formula of a hydrate?

a) If the mass of H_2O and hydrate are 0.60 and 1.50 g, respectively, then the mass % of water of crystallization is 40. %.
b) $MgSO_4.7H_2O$ is an example of an alum.
c) Incomplete dehydration will cause the calculated value of "x" to be higher than the actual value.
d) The calculated value of x will be lower than the actual value if the mass of empty crucible was more than true value.
e) Heating the hydrated salt too strongly at the beginning, will lead to a decrease in calculated value of x.

6. In an experiment on limiting reactants, a student dissolved a 1.30 g sample of a mixture of $BaCl_2.2H_2O$ (molar mass = 244 g/mol) and $Na_3PO_4.12H_2O$ (molar mass = 380. g/mol) in 200. mL water, and the mass of $Ba_3(PO_4)_2$ (molar mass = 601 g/mol) collected was=0.50g. Knowing that addition of two drops of $BaCl_2$ solution to the filtrate lead to precipitate formation, calculate the mass percent of $BaCl_2.2H_2O$ in the original sample:

The unbalanced equation is:

$$BaCl_2 + Na_3PO_4 \rightarrow Ba_3(PO_4)_2 + NaCl$$

a) 61 % b) 39 % c) 53 % d) 47 % e) 50. %

7. Again, in another experiment on limiting reactants, a mixture of 0.65 g $BaCl_2.2H_2O$ and 0.35 g $Na_3PO_4.12H_2O$ was dissolved in water. Calculate the mass of $Ba_3(PO_4)_2$ precipitate formed.

a) 0.50 g b) 0.28 g c) 0.20 g d) 0.12 g e) 0.39 g

8. Given that a 10.00 mL sample of vinegar solution was titrated with 35.0 mL of 0.14 M NaOH solution, calculate the mass percent of acetic acid (molar mass = 60.0 g/mol) in vinegar, assuming the density of vinegar solution is 1.10 g/mL:

a) 3.4 % b) 2.3 % c) 1.9 % d) 5.0 % e) 2.7%

9. Which of the following statements is **correct** concerning acetic acid determination in vinegar?

a) The buret should be rinsed with NaOH solution before titration.
b) The titration flask should be rinsed with vinegar solution.
c) A standard 0.100 M NaOH solution can be prepared by weighing 4 gram solid NaOH pellets (molar mass 40.0 g/mol) and dissolving it into one liter solution.
d) Starch – Iodine can be used as an indicator.
e) In this experiment KHP was to be used to standardize HCl solution.

10. A 0.25 g antacid tablet was dissolved in 35.0 mL of 0.10 M HCl solution. The excess acid was titrated to the end point with 10.0 mL of 0.12 M NaOH solution. Calculate the neutralizing capacity in mol HCl/g tablet.

a) 6.6×10^{-3} b) 1.2×10^{-2} c) 7.7×10^{-3} d) 5.5×10^{-2} e) 9.2×10^{-3}

11. Which of the following statements is **correct** concerning antacid tablet neutralizing capacity?

a) The active ingredient in most commertial antacid tablets is NaOH.
b) An antacid tablet is dissolved in water first then titrated with standard HCl solution.
c) Bromothymol blue solution was used as an indicator.
d) Metal carbonates react with HCl to form metal hydroxides.
e) The HCl solution added to the antacid must be less than is necessary to completely neutralize the antacid.

12. A 25.0 mL of 0.010 M KIO_3 containing an excess amount of KI is added to a 0.33 g sample of lemon solution containing vitamin C. The solution is titrated to the end point with 6.60 mL of 0.100 M $Na_2S_2O_3$ solution. Calculate the mass of vitamin C (molar mass = 176.1 g/mol) in the original sample.
Balanced equations:

$6H^+ + IO_3^- + 8I^- \rightarrow 3I_3^- + 3H_2O$
$C_6H_8O_6 + I_3^- + H_2O \rightarrow C_6H_8O_7 + 3I^- + 2H^+$
$2S_2O_3^{2-} + I_3^- \rightarrow 3I^- + S_4O_6^{2-}$

a) 0.026 g b) 0.10 g c) 0.048 g d) 0.074 g e) 0.33 g

13. Which of the following statements is **not correct** concerning vitamin C analysis?

a) The red brown solution produced by the addition of excess KI to KIO_3 is due to presence of I_3^-.
b) Cooked fruits and vegetables have lower vitamin C content than fresh fruits and vegetables.
c) If the blue color does not appear when the starch solution is added during the titration, the solution should be discarded and the experiment should be repeated.
d) Starch-iodine solution was used as an indicator.
e) Bromothymol blue solution was used as an indicator.

14. In bleach analysis, standardization of $Na_2S_2O_3$ solution was as follows: 1 g KI and 5 mL of HCl were added to 25.0 mL of 0.010 M $K_2Cr_2O_7$, and the librated iodine was titrated with 20.0 mL $Na_2S_2O_3$ solution. Calculate the molarity of $Na_2S_2O_3$ a solution.
The unbalanced equations is:

$$Cr_2O_7^{2-} + S_2O_3^{2-} \rightarrow Cr^{3+} + S_4O_6^{2-}$$

a) 0.010 b) 0.075 c) 0.11 d) 0.086 e) 0.067

15. A bleach solution that is 6.58 % by mass (density = 1.15 g/mL) is diluted with a dilution factor = 15. Calculate the molarity of the diluted bleach solution. (Molar mass NaClO = 74.5 g/mol)

a) 0.068 M b) 0.022 M c) 0.085 M d) 0.056 M e) 0.046 M

16. Which of the following statements is **not correct** concerning bleach analysis?

a) Sodium thiosulfate, $Na_2S_2O_3$, reduces I_3^- to I^-.
b) Sodium thiosulfate can readily be prepared from solid $Na_2S_2O_3$ as a primary standard solution.
c) Potassium dichromate, $K_2Cr_2O_7$, is used as a primary standard solution.
d) I_3^- oxidizes $Na_2S_2O_3$ to $Na_2S_4O_6$.
e) $Na_2S_2O_3$ solution might be oxidized by oxygen or bacterial action.

General Chemistry Lab. 109
Mid-Term Exam

Date: 18/4/2009
Time: 70 min.

Name: …….. Reg. No.: ……...

Instructor Name: …… Section : ……..

ANSWER SHEET

1.	a	b	c	d	e	8.	a	b	c	d	e
2.	a	b	c	d	e	9.	a	b	c	d	e
3.	a	b	c	d	e	10.	a	b	c	d	e
4.	a	b	c	d	e	11.	a	b	c	d	e
5.	a	b	c	d	e	12.	a	b	c	d	e
6.	a	b	c	d	e	13.	a	b	c	d	e
7.	a	b	c	d	e	14.	a	b	c	d	e

GOOD LUCK

Answer each of the following questions and put "X" on the correct choice on the front page.

1. Which of the following statements is **not correct**?

   a) Lab instructor must be notified if there is a mercury spill due to a broken mercury thermometer.
   b) Every chemical in the lab must be treated as hazardous.
   c) Fire alarms, fire extinguishers, showers, and emergency eye washes, are examples of safety equipments in your lab.
   d) Excess chemicals can be returned to original stock solutions.
   e) Clean pipets and droppers cannot be inserted into any reagent bottle.

2. Given the following set of data for the determination of density of solid material:

   - Mass of empty beaker = 34.12 g
   - Mass of empty beaker + solid = 48.51 g
   - Initial graduated cylinder reading = 25.0 mL
   - Final graduated cylinder reading = 29.7 mL

   The density (g/mL) of the solid is

   a) 3 b) 3.062 c) 3.1 d) 3.06 e) 3.0617

3. Which of the following statements is **not correct**?

   a) Specific gravity is defined as the ratio of density of a material to the density of water.
   b) Specific gravity is defined as the ratio of density of water to the density of material.
   c) If air bubbles were adhered to metal pellets in the cylinder during density determination, the experimental value of density will be lower than actual.
   d) The density of diamond is 3.51 g/cm^3 and the density of lead is 11.3 g/cm^3. If equal masses of diamond and lead were transferred to equal volumes of water in graduated cylinders, the level of water in cylinder that contained diamond will be higher.
   e) The mass of a liquid with a density of 3.2 g/mL and a volume of 25 mL is 80.g.

4. When 1.243 g of the anhydrous copper(II) sulfate (molar mass: 159.6 g/mol) was allowed to absorb water vapor, its mass increased to 1.803 g. What is the value of the water of crystallization (x) in the formula of the $CuSO_4.xH_2O$ hydrate?

   a) 4 b) 6 c) 5 d) 12 e) 7

5. Which of the following statements is **correct** concerning calculate value of (x) water of crystallization:

   a) $Na_2SO_4.xH_2O$ is an example of an alum.
   b) $KAl(SO_4)_2$ is an example of hydrate.
   c) If the salt decomposes giving volatile products, then the calculated value of (x) would be smaller than the actual value.
   d) If the dehydration of the hydrate is incomplete, the calculated value of (x) will be lower than the actual value.
   e) If the mass of the hydrate is 1.166 g and the water removed from it is 0.642 g, then the mass percent of the anhydrous salt in the hydrate is 60%.

- Use these data to answer questions 6 and 7:
  In an experiment on Limiting Reactant Concentration, the following data were obtained for the reaction between $CaCl_2$ and $Na_3PO_4.12H_2O$ dissolved into 100.mL water according to:

$$3\ CaCl_{2(aq)} + 2\ Na_3PO_{4(aq)} \rightarrow Ca_3(PO_4)_{2(s)} + 6\ NaCl_{(aq)}$$

Given that 19.98 g of $CaCl_2$ (molar mass =110. g/mol) and 30.4 g of $Na_3PO_4.12\ H_2O$ (molar mass =380. g/mol) were dissolved in 100. mL aqueous solution,

6. The limiting reactant is:

   a) $Ca_3(PO_4)_2$ b) $Na_3PO_4.12H_2O$ c) $CaCl_2$ d) NaCl e) No limiting reactant

7. The mass of solid $Ca_3(PO_4)_2$ precipitate (molar mass =310. g/mol) assuming complete reaction is

   a) 11.3 g b) 13.7 g c) 14.8 g d) 15.9 g e) 12.4 g

8. Given that a 25.00 mL sample of vinegar solution was titrated with 29.35 mL of 0.512 M NaOH solution, calculate the mass percent of acetic acid (molar mass = 60.0 g/mol) in vinegar. Assume the density of vinegar solution is 1.05 g/mL.

   a) 4.49% b) 9.00% c) 3.43% d) 2.38% e) 1.44%

9. Given the following set of data concerning standardization of NaOH solution:
   - mass of KHP (molar mass = 204.2 g/mol) = 2.97 g
   - initial buret reading of NaOH = 1.15 mL
   - Final buret reading of NaOH = 30.15 mL

   Calculate the molar concentration of NaOH solution.

   a) 0.502 M b) 0.670 M c) 0.839 M d) 0.333 M e) 0.100 M

10. Which of the following statements is **not correct**?

    a) In the titration of vinegar solution; if the buret which is used for NaOH contains water, then the calculated molarity of acetic acid in vinegar solution would increase.
    b) During the titration of vinegar solution; rinsing the inside walls of the titration flask with distilled water, will decrease the calculated molarity of acetic acid in vinegar solution.
    c) KHP ($KHC_8H_4O_4$) is a primary standard substance.
    d) Standard NaOH solution can not be prepared by weighing the required amount of NaOH accurately in desired amount of distilled water.
    e) The volume of water added to KHP in your experiment does not have to be measured carefully.

11. A 0.86 g antacid tablet containing 20% by mass $Mg(OH)_2$ (Molar mass=58.3 g/mol), 20% by mass $Al(OH)_3$ (Molar mass = 78.0 g/mol) and 20% $NaHCO_3$ (Molar mass = 84.0 g/mol) by mass was dissolved in 50.0 mL of 0.50 M HCl and the excess unreacted acid was back titrated with 0.100 M NaOH. What is the volume of NaOH required for back titration.

    a) 0.087 L b) .095 L c) 0.080 L d) 0.050 L e) 0.104 L

12. Which of the following statements is **correct**?

    a) The neutralization capacity per mol of $Mg(OH)_2$ is greater than that of $Al(OH)_3$.
    b) The color of bromothymol blue in base is yellow.
    c) Antacid tablet solution is boiled before titration to remove CO_2 gas.
    d) As the mass of antacid sample increase the volume of NaOH needed to back titrate the solution will increase.
    e) The number of moles of acid that reacts with antacid tablet equals number moles of acid added plus number of moles of NaOH used for back titration.

13. A 25.0 mL of 0.011 M KIO_3 containing an excess amount of KI, is added to 0.15 g sample containing vitamin C, the solution is titrated to the end point with 14.0 mL of 0.012 M $Na_2S_2O_3$. Calculate the mass percent of vitamin C (molar mass = 176.1 g/mol).
    Balanced equations:
    $6H^+ + IO_3^- + 8I^- \rightarrow 3I_3^- + 3H_2O$
    $C_6H_8O_6 + I_3^- + H_2O \rightarrow C_6H_8O_7 + 3I^- + 2H^+$
    $2S_2O_3^{2-} + I_3^- \rightarrow 3I^- + S_4O_6^{2-}$

    a) 87% b) 72% c) 62% d) 57% e) 97%

14. Which of the following statements is **correct**:

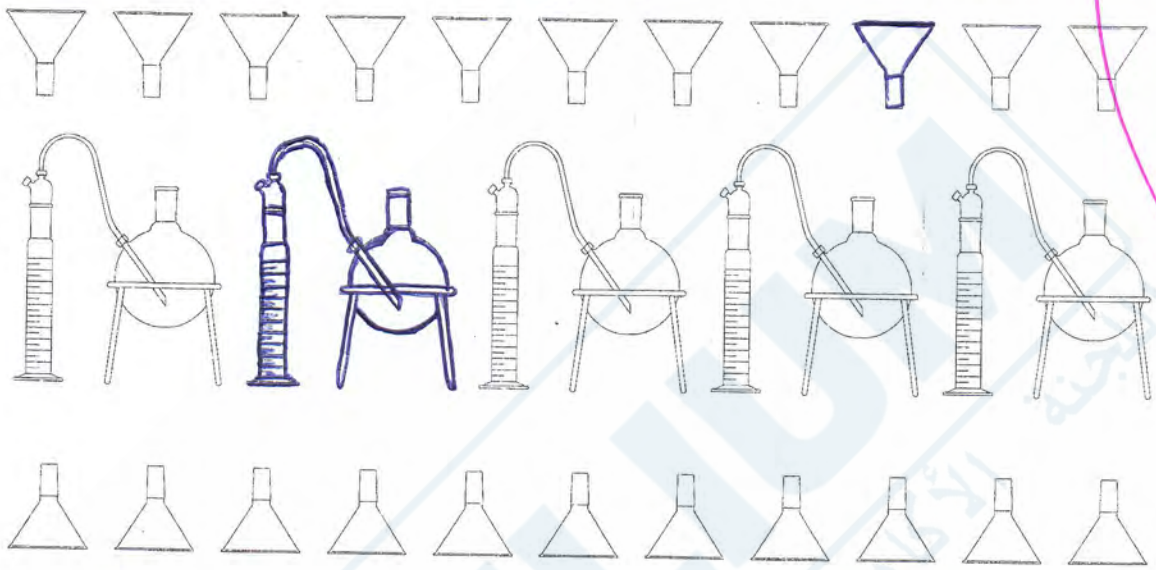
    a) Vitamin C is an oxidizing agent.
    b) Vitamin C is a base.
    c) The starch solution should be added when the solution is colorless.
    d) Potassium iodate is used to oxidize I^- to I_3^- which then oxidizes vitamin C.
    e) Sodium thiosulfate is oxidizing agent.

CHEMISTRY 109 MIDTERM EXAM DEPARTMENT OF CHEMISTRY

75 MIN November 14, 2007

NAME دعاء خالد أبو طبع SECTION ..... REGISTRATION No. 20769915

16/16



1) ~~a~~ b c d e

2) a ~~b~~ c d e

3) a b ~~c~~ d e

4) a b ~~c~~ d e

5) a ~~b~~ c d e

6) a b c ~~d~~ e

7) ~~a~~ b c d e

8) a ~~b~~ c d e

9) a ~~b~~ c d e

10) a ~~b~~ c d e

11) a b c ~~d~~ e

12) a ~~b~~ c ~~d~~ e

13) a b c d ~~e~~

14) a b c d ~~e~~

15) a b ~~c~~ d e

16) a b c d e

the end point has been passed

Vinegar Experiment

1. A 35.0 mL of 0.620 M NaOH solution was needed to completely neutralize 10.0 mL of vinegar solution. Calculate the number of grams of acetic acid per liter of vinegar solution.

   (Molar mass of acetic acid 60.0 g/ mol)

   a) 130. b) 88.2 c) 46.2 d) 60.0 e) 109

2. Which of the following statements is correct concerning the vinegar experiment?

   a) A standard solution of NaOH is obtained by dissolving a definite mass of solid NaOH in water.

   b) If three drops of NaOH solution adhere (يلتصق) to the side of the flask and does not mix with the vinegar solution then the calculated concentration of the vinegar will be more than the actual concentration of the vinegar.

   c) If 6.0 mL of distilled water was added to the above vinegar solution during titration, then the volume of the base needed to neutralize the vinegar solution should be more than the actual.

   d) The indicator used for end point detection is bromophenol blue

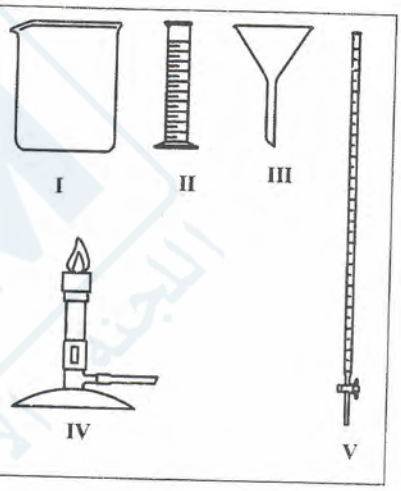
3. Given that the molarity of vinegar solution is 0.50 M and its density is 1.2 g/ mL. Calculate the mass percent of acetic acid in vinegar (Molar mass of acetic acid 60.0 g/ mol)

   a) 0.50 % b) 3.0 % c) 2.5 % d) 1.2 % e) 0.6 %

Techniques and Measurments

4. The correct order of naming of the apparatus shown is:

	I	II	III	IV	V
a)	beaker	graduated cylinder	buret	funnel	Bunsen burner
b)	funnel	beaker	Bunsen burner	graduated cylinder	buret
c)	beaker	graduated cylinder	funnel	Bunsen burner	buret
d)	Bunsen burner	buret	graduated cylinder	beaker	funnel
e)	graduated cylinder	beaker	funnel	buret	Bunsen burner



5. Given the following set of data

- Mass of empty beaker = 12.65 g
- Mass of beaker + metal pieces = 14.95 g
- Initial water level in the graduated cylinder = 13.8 mL
- Final water level in the graduated cylinder with metal pieces = 15.4 mL

Calculate the density (in g/ cm^3) of the metal pieces.

a) 1.9 b) 1.4 c) 0.70 d) 1.6 e) 2.3

The neutralizing capacity of antacid tablets

6. A 50.0 mL solution of 0.15 M HCl was used to dissolve a 1.45 g of antacid tablet. The excess HCl was then titrated with 22.0 mL of 0.095 NaOH solution. If the active ingredient in the tablet is $Mg(OH)_2$, calculate the mass percent of $Mg(OH)_2$ in the tablet.

(Molar mass of $Mg(OH)_2$ = 58.3 g/mol)

a) 15 % b) 43% c) 22 % d) 11 % e) 4.0%

$\frac{23.4}{100} \times 0.409$ g 0.0936 $Al(OH)_3 + 3HCl \longrightarrow AlCl_3 + 3H_2O$

g 0.0936 $Mg(OH)_2 + 2HCl \longrightarrow MgCl_2 + 2H_2O$

7. An antacid tablet contains 23.4% by mass $Al(OH)_3$, and 23.4% by mass $Mg(OH)_2$. Assuming the stomach acid is 0.13 M HCl solution, calculate the volume (in mL) of stomach acid that can be neutralized by 0.40 g antacid tablet.

(Molar mass of $Al(OH)_3$ = 78.0 g/mol and $Mg(OH)_2$ = 58.3 g/mol)

a) 52 b) 28 c) 24 d) 22 e) 130

$0.0936\ g\ Al(OH)_3 \times \frac{1\ mol}{78.0\ g} = 1.20 \times 10^{-3}\ mol \times \frac{3\ mol\ HCl}{1\ mol\ Al(OH)_3} = 3.6 \times 10^{-3}\ mol\ HCl$

$0.0936\ g\ Mg(OH)_2 \times \frac{1\ mol}{58.3\ mol} = 1.61 \times 10^{-3}\ mol \times \frac{2\ mol\ HCl}{1\ mol\ Mg(OH)_2} = 3.22 \times 10^{-3}\ mol\ HCl$

$mol_s = 6.82 \times 10^{-3}$ mol HCl

$M = \frac{mol_s}{V} \Rightarrow V = \frac{mol_s}{M} = \frac{6.82 \times 10^{-3}}{0.13} = 0.0525\ L = 52.5\ mL$

8. In the antacid experiment, two students dissolved the antacid tablet using the same amount of HCl. However, student X used 1.5 g antacid, while student Y used 0.9 g. Then

a) Student X will need more from NaOH for back titration of the excess acid.

b) Student Y will need more from NaOH for back titration of the excess acid.

c) Both students need the same amount from NaOH for back titration of the excess acid.

Formula of a hydrate

9. The mass percent (%) of the water in the hydrate $NaFe(SO_4)_2 \cdot xH_2O$ is 38%

- Molar mass of $NaFe(SO_4)_2$ = 271.0 g /mol
- Molar mass of H_2O = 18.0 g /mol

Calculate the value of x.

a) 6 b) 9 c) 11 d) 12 e) 15

1 mol → 271.0 g + x 18.0

$38\% = \frac{x\ 18.0}{271.0\ g + 18x} \times 100\%$

$38\% = \frac{y}{271 + y} \times 100\%$

$100y = 10298 + 38y$

$62y = 10298$

$X = \frac{m/m.m\ (H_2O)}{m/m.m\ (H_2O)}$

$= \frac{38/18}{62/271}$

10. In the determination of water of crystallization of potassium alum ($KAl(SO_4)_2 . x H_2O$) experiment, the following data were obtained:

- Mass of empty crucible = 12.65 g
- Mass of crucible + potassium alum = 13.20 g
- Mass of crucible + anhydrous salt = 13.00 g
- Molar mass of $KAl(SO_4)_2$ = 258.0 g / mol
- Molar mass of H_2O = 18.0 g / mol

Calculate the mass percent of water in the alum.

a) 96 % b) 36 % c) 64% d) 14 % e) 5.9%

11. Which of the following statement is correct concerning the formula of hydrate experiment?

a) If all of the water had not been driven off, then the calculated value of x is same as the actual value.

b) The crucible should be weighed when it is hot to give an accurate weight on the balance.

c) The $Al_2(SO_4)_3$ is an example of an alum.

d) If all of the water had not been driven off, then the calculated value of x will be less than the actual value.

e) If all of the water had not been driven off, then the calculated value of x will be more than the actual value.

The Empirical formula of an oxide

12. Given the following data:

- Mass of empty crucible = 12.45 g
- Mass of crucible + metal = 12.66 g
- Mass of crucible + metal oxide = 12.91 g
- Molar mass of metal = 27.0 g / mol
- Molar mass of O = 16.0 g / mol

What is the empirical formula of metal oxide

a) MO b) MO_2 c) M_2O d) M_2O_3 e) M_3O_4

13. During the determination of empirical formula of MgO, water is added to:

a) convert MgO to $Mg(OH)_2$.
b) convert Mg_3N_2 to MgO.
c) convert Mg to MgO.
d) convert Mg_3N_2 to Mg.
e) convert Mg_3N_2 to $Mg(OH)_2$.

Vitamin C analysis

14. Given following equations

$$IO_3^-{}_{(aq)} + 8I^-_{(aq)} + 6H^+_{(aq)} \longrightarrow 3I_3^-{}_{(aq)} + 3H_2O_{(l)}$$

$$C_6H_8O_6{}_{(aq)} + I_3^-{}_{(aq)} + H_2O_{(l)} \longrightarrow C_6H_8O_7{}_{(aq)} + 3I^-_{(aq)} + 2H^+_{(aq)}$$

$$2S_2O_3^{2-}{}_{(aq)} + I_3^-{}_{(aq)} \longrightarrow S_4O_6^{2-}{}_{(aq)} + 3I^-_{(aq)}$$

A 25.00 mL solution of 0.0125 M KIO_3 containing excess KI and H_2SO_4 was added to 30.0 mL of lemon juice solution (containing vitamin C). The excess of I_3^- was then titrated to the end point with 10.00 mL of 0.050 M $Na_2S_2O_3$ solution. Calculate the mass of vitamin C in the sample. (Molar mass of vitamin C = 176.0 g/ mol)

a) 0.033 b) 0.066 c) 0.077 d) 0.099 e) 0.12

15. Which of the following statement is correct concerning the vitamin C experiment?

a) Sodium thiosulfate is an oxidizing agent in this experiment.
b) The IO_3^- is an reducing agent in this experiment.
c) A wet beaker can be used to obtain a sample of thiosulfate solution from store-room.
d) If 1.0 ml of thiosulfate solution was spilled away from the flask, (ينسكب خارج القارورة) then the calculated mass of vitamin C in the sample will be less than the actual.

16. In the above experiment, if no blue color was obtained when the starch was added. This indicates:

a) The solution is acidic since starch is colorless in acidic medium.
a) All the amount of I^- in the solution is in the form of I_3^-
b) The amount $S_2O_3^{2-}$ is not enough to reduce all the amount of I_3^-
c) The end point has been passed.

Chemistry Department

Chem 109

Final Exam

2 Hours

15/1/2005

Name(in Arabic):_____ Registration Number :_____

Instructor Name: Time:

R= 0.08206 atm.L./mol.K. ; atm=760 mmHg. ; $\Delta T_f = i K_f X_A$,

Answer sheet

1-	a	b	c	d	e					11-	a	b	c	d	e				
2-	a	b	c	d	e					12-	a	b	c	d	e				
3-	a	b	c	d	e					13-	a	b	c	d	e				
4-	a	b	c								a	b	c	d	e				
5-	a	b	c	d	e					15	a	b	c	d	e				
				d						16		b	c	d	e				
7-		b								17		b		d	e				
8-	a	b	c	d	e					18-	a	b	c	d	e				
9-	a	b	c	d	e					19-	a	b	c	d	e				
10-	a	b	c	d	e					20-	a	b	c	d	e				