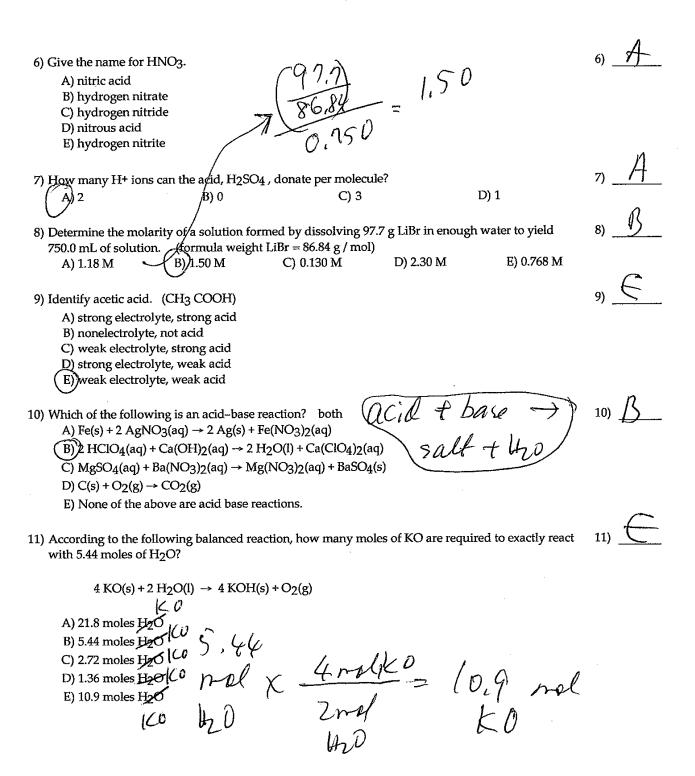
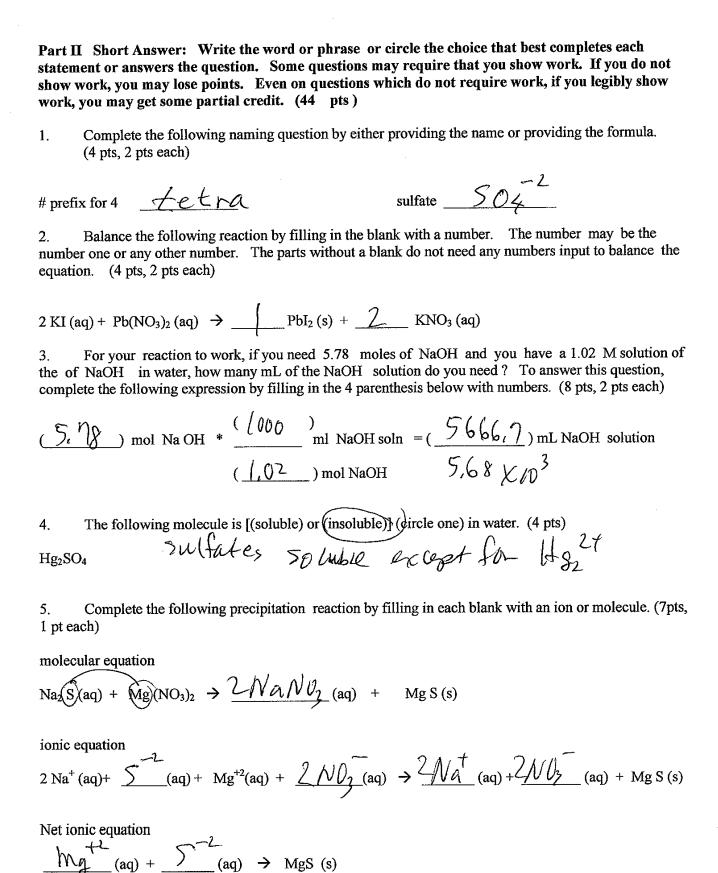
Exam	II General Chemistry I Lecture Fall 2013 10/21/13 Monday 9:30 A Dr. Hahn Exam #
Name_	(print) Name(sign)
choice obviou	show work for partial credit and full credit on the Long Answers and in some of the Short Answer Questions. Mult questions have no partial credit. Please write anything you want graded legibly. If I cannot read your work, I sly cannot grade it. (1 pts print and sign exam) If you run out of space, please continue on the back page of the nd clearly tell me where the remaining answer can be found. Avogadro's number = $6.022 \times 10^{23}$
	MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. (2 question, 22 pts pts total)
	1) What is the empirical formula for Hg <sub>2</sub> (NO <sub>3</sub> ) <sub>2</sub> ?  A) Hg <sub>2</sub> NO <sub>3</sub> B) Hg <sub>4</sub> (NO <sub>3</sub> ) <sub>4</sub> C) Hg <sub>2</sub> (NO <sub>3</sub> ) <sub>2</sub> D) Hg(NO <sub>3</sub> ) <sub>2</sub>
	E)HgNO3
	2) Which of the following solutions will have the highest concentration of chloride ions? 9 (2) $\frac{1}{30}$ (3) 0.10 M AlCl <sub>3</sub> $\frac{1}{30}$ H + 3 (1) $\frac{1}{30}$ (2) $\frac{1}{30}$ (3) 0.10 M LiCl (2) 0.10 M MgCl <sub>2</sub> $\frac{1}{30}$ (3) 0.10 M CaCl <sub>2</sub> (4) + 2 (1) $\frac{1}{30}$ (4) $\frac{1}{30}$ (5) 0.05 M CaCl <sub>2</sub> (1) $\frac{1}{30}$ (1) $\frac{1}{30}$ (2) $\frac{1}{30}$ (3) 0.05 M CaCl <sub>2</sub> (3) 0.05 M CaCl <sub>2</sub> (4) $\frac{1}{30}$ (1) $\frac{1}{30}$ (2) $\frac{1}{30}$ (3) 0.05 M CaCl <sub>2</sub> (4) 0.05 M CaCl <sub>2</sub> (3) 0.05 M CaCl <sub>2</sub> (4) 0.0
/	3) Determine the oxidation state of P in PO <sub>3</sub> 3  A) +2  B) 0  C) +3  D) -3  E) +6
	4) Calculate the molar mass for Mg(ClO <sub>4</sub> ) <sub>2</sub> .  A) 119.52 g/mol  B) 75.76 g/mol  C) 123.76 g/mol  C) 123.76 g/mol  D)223.21 g/mol  E) 247.52 g/mol  C) 247.52 g/mol  C) 247.52 g/mol  C) 247.52 g/mol
	5) Determine the name for $P_4O_{10}$ .  A) phosphorus (IV) oxide  B) Petraphosphorus decoxide  C) diphosphorus pentoxide  D) phosphorus oxide  E) phosphorus (II) oxide





Exam II

General Chemistry I Lecture

Dr. Hahn

Fall

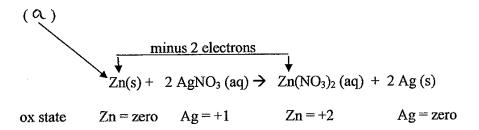
2013 form (9:30 A)

page 3

Circle the following which are strong bases. (5 pts) 6.

Sr (OH)<sub>2</sub> NaOH NH4 OH LiOH  $NH_3$ 

For the following redox reaction, fill in the parenthesis by the reagent with either the letter (a) or (b). (a) is being oxidized (b) is being reduced (4 pts)



If you collect oxygen gas being generated in a reaction under water, if the total pressure is 1.3 atm 8. and the water pressure is 0.2 atm, what is the pressure of the oxygen? (show work) (8 pts)

$$P_{\text{total}} = 1.3 \text{ atm} = P_{\text{tro}} + P_{\text{02}}$$

$$0.2 \text{ atm}$$

$$P_{\text{02}} = P_{\text{total}} - P_{\text{02}} = 1.3 \text{ atm} - 0.2 \text{ atm}$$

$$P_{\text{02}} = 1.1 \text{ atm}$$

a. Given the reaction below, what is the theoretical yield of PbCl<sub>2</sub> in grams if you start out with (FW of  $PbCl_2 = 278.20 \text{ g/mol}$ , FW of KCl 74.60 g/mol) Assume excess grams of KCl amount of the other reactant. (show work) (15 pts)

 $2 \text{ KCl (aq)} + \text{Pb(NO}_3)_2 \text{ (aq)} \rightarrow \text{PbCl}_2 \text{ (s)} + 2 \text{ KNO}_3 \text{ (aq)}$ 87.2g

= 162,65 Pb43 163 g Pb42 5.3

b. If the number of grams of the PbCl<sub>2</sub> based on the amount of Pb(NO<sub>3</sub>)<sub>2</sub> is 200.5 grams, what is the limiting reagent?

[KCl] or [Pb(NO<sub>3</sub>)<sub>2</sub>]} (circle one) (3 pts)

getles with KU KCl is limiting Run

2. You have a mixture of gases with a pressure of 1.1 atm. in a container of volume 2.5 L at 275 K. If the new temperature is 305 K at a pressure of 0.97 atm, what is the volume ?  $(P_1V_1)/(P_2V_2) = T_1/T_2$  (I made up these numbers so that the numbers have no relation to reality.) (show work) (15 pts)

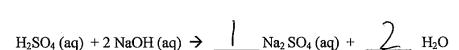
$$\begin{array}{ll} P_{1} = 1.1 atm & P_{2} = 0.97 atm \\ V_{1} = 2.5 \, l & V_{2} = 7 \\ T_{2} = 2.5 \, k & T_{2} = 305 \, k \\ T_{1} = 2.75 \, k & T_{2} = 305 \, k \\ \hline P_{1} V_{1} = \frac{T_{1}}{P_{2} V_{2}} & \text{or} & \frac{P_{2} V_{2}}{P_{1} V_{1}} = \frac{T_{2}}{T_{1}} \\ V_{2} = \frac{T_{2}}{T_{1}} P_{2} V_{1} = \frac{(305 \, \text{k})(1.1 atm)(2.5 \, l)}{(2.15 \, \text{k})(0.97 atm)} \\ V_{3} = 3.1 \, \text{liter} \end{array}$$

Exam I	I General Chemistry	y I Lecture Fall 2013	10/21/13 Mo	nday 9:30 B	Dr. Hahn Exam	ı#
Name_	k	ly	(print) Name		gr	<u>Zer</u> (sign)
choice q	uestions have no partly cannot grade it. (1	credit and full credit of tial credit. Please we pts print and sign exerce the remaining answ	rite anything you am) If you rur	u want graded l n out of space , j	egibly. If I cannot rolease continue on the	ead your work, I
	MULTIPLE CHOICE question, 22 pts pts to	E. Choose the one altotal)	ernative that bes	t completes the	e statement or answe	rs the question. (2
	According to the fo with 5.44 moles of	ollowing balanced rea H <sub>2</sub> O?	ction, how many	moles of KO ar	e required to exactly i	react 1)
	4 KO(s) + 2	2 H <sub>2</sub> O(l) → 4 KOH(s	s) + O <sub>2</sub> (g)			
	A) 5.44 moles H B) 21.8 moles H C) 10.9 moles H D) 1.36 moles H E) 2.72 moles H	ed ICO				
;	2) How many H+ ion (A) 2	s can the acid, H2SO4 B) 3	, donate per mol		D) 1	2) <u>A</u>
:	O	r mass for Mg(ClO4)2				3)
	4) What is the empirion A) Hg(NO <sub>3</sub> ) <sub>2</sub> B) Hg <sub>2</sub> (NO <sub>3</sub> ) <sub>2</sub> C) HgNO <sub>3</sub> D) Hg <sub>4</sub> (NO <sub>3</sub> ) <sub>4</sub> E) Hg <sub>2</sub> NO <sub>3</sub>	cal formula for Hg2(N	IO <sub>3</sub> ) <sub>2</sub> ?			4)
	5) Determine the oxid	lation state of P in PO	3 <sup>3</sup>			5) 📗
	A) 0	(B))+3	C) -3	D) +2	E) +6	

6) Give the name for HNO	O3.				6)
A) nitrous acid B) hydrogen nitrite					
C) hydrogen nitride					
D) hydrogen nitrate		•			
(E) nitric acid					Λ
7) Determine the name fo	ar PaOto				$_{_{\mathcal{D}}}\mathcal{D}$
A) phosphorus (II) o	<del>-</del>				.,
B) diphosphorus per					
C) phosphorus (IV)					
D) tetraphosphorus					
E) phosphorus oxide	e				
0) D	6 3tt 6		77 - T:D.:	أدادات معسمه مديد	« <del>(</del>
8) Determine the molarity 750.0 mL of solution.		med by dissolving 9 : LiBr = 86.84 g / mo		water to yield	0)
A) 0.130 M	B) 0.768 M	C) 1.18 M	D) 2.30 M	(E) 1.50 M	
,	_,	-,	,	O	$\circ$
9) Identify acetic acid. (C	CH <sub>3</sub> COOH)				9)
A) weak electrolyte,	strong acid				
B) strong electrolyte					
(C))weak electrolyte,					
D) strong electrolyte E) nonelectrolyte, no					
E) Honelectroryte, no	or acid				Ω
10) Which of the following	r is an acid-base r	eaction?			10) /
A) Fe(s) + 2 AgNO <sub>3</sub> (					,
(B))2 HClO <sub>4</sub> (aq) + Ca			aq)		
C) MgSO <sub>4</sub> (aq) + Ba(	• •		=		
D) $C(s) + O_2(g) \rightarrow C$	O <sub>2</sub> (g)				
E) None of the abov	e are acid base re	actions.			
					h
11) Which of the following	solutions will ha	ve the highest conce	ntration of chloride	ions?	11)
A) 0.10 M LiCl					
B) 0.05 M CaCl <sub>2</sub>					
C) 0.10 M MgCl <sub>2</sub>					
(D) 0.10 M AICl <sub>3</sub>					
E) All of these soluti	ions have the sam	ne concentration of c	nioride ions.		

· Springer

statement or ans show work, you	swers the question. Some q	questions may require to questions which do not	oice that best completes each hat you show work. If you do not require work, if you legibly show
1. Complete pts, 2 pts each)	the following naming questi	on by either providing th	e name or providing the formula. (4
# prefix for 5	penda	nitrate	NOz
	ny other number. The parts w	•	mber. The number may be the ed any numbers input to balance the



3. For your reaction to work, if you need 8.23 moles of HCl and you have a 2.00 M solution of the of HCl in water, how many mL of the HCl solution do you need? To answer this question, complete the following expression by filling in the 4 parenthesis below with numbers. (8 pts, 2 pts each)

$$(8,2)$$
 mol HCl \*  $(000)$  ml HCl soln =  $(4115)$  mL of HCl solution  $(2,00)$  mol HCl  $(2,00)$  mol HCl  $(2,00)$  mol HCl  $(2,00)$ 

4. The following molecule is [(soluble) or (insoluble)] (circle one) in water. (4 pts)

(NH<sub>4</sub>)<sub>2</sub>S 5<sup>-1</sup> (NS) (White except for NH<sub>4</sub> soluble)

5. Complete the following precipitation reaction by filling in each blank with an ion or molecule. (7 pts, 1 pt each)

molecular equation

$$(NH_4)_3PO_4$$
 (aq) + 3 AgNO<sub>3</sub> (aq)  $\rightarrow$  2 M<sub>4</sub>, M<sub>3</sub> (aq) + Ag<sub>3</sub>PO<sub>4</sub> (s)

ionic equation

$$3 \text{ NH}_{4}^{+}(aq) + 104 \text{ (aq)} + 214 \text{ (aq)$$

Dr. Hahn General Chemistry I Lecture Exam II Fall 2013 form (9:30 B)

6. Circle the following which are weak bases (5 pts)

Na OH

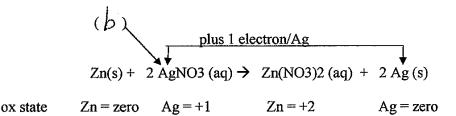


Ba (OH)<sub>2</sub>



KOH

For the following redox reaction, fill in the parenthesis by the reagent with either the letter (a) or (b). (a) is being oxidized (b) is being reduced (4 pts)



8. If you collect oxygen gas being generated in a reaction under water, if the total pressure is 775 mm Hg and the water pressure is 26 mm Hg what is the pressure of the oxygen? (show work) (8 pts)

1. a. Given the reaction below, what is the theoretical yield of Ag in grams if you start out with 77.9 grams of  $AgNO_3$  (FW of Ag = 107.87 g/mol, FW of  $AgNO_3$  169.88 g/mol) Assume excess amount of the other reactant. (show work) (15 pts)

 $Zn(s) + 2 AgNO_3(aq) \rightarrow Zn(NO_3)_2(aq) + 2 Ag(s)$ 

17,9 x mol Agkos 2 mol Ag x 107,87 g Ag = 169,88 g 2 mol Ag x mol

49.5g My

b. If the number of grams of the Ag based on the amount of Zn is 25 g, what is the limiting reagent?

[Zn] or [AgNO<sub>3</sub>]} (circle one) (3 pts)

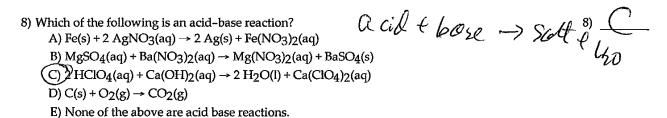
My MD3 → 49.52 Mg 253 Mg

You have a mixture of gases in a volume of 0.75 liters at pressure 1.4 atm at an unknown temperature. If the new volume is 1.8 liters at pressure 0.7 atm and temperature of 298.5 K, what is the old unknown temperature?  $(P_1V_1)/(P_2V_2) = T_1/T_2$  (I made up these numbers so that the numbers have no relation to reality.) (show work) (15 pts)

$$V_{1} = 0.75l$$
 $V_{2} = 1.8l$ 
 $V_{3} = 0.75l$ 
 $V_{4} = 0.75l$ 
 $V_{5} = 0.76l$ 
 $V_{7} = 0.76l$ 

$$T_1 = \left(\frac{P_1 V_1}{P_2 V_2}\right) T_2$$

Exam	II General Chemistry I Lecture Fall 2013 10/21/13 Monday 10:30 A Dr. Hahn Exam#_	<del></del>
Name_	(print) Name	_(sign)
choice obviou	show work for partial credit and full credit on the Long Answers and in some of the Short Answer Questions have no partial credit. Please write anything you want graded legibly. If I cannot read you sly cannot grade it. (1 pts print and sign exam) If you run out of space, please continue on the back and clearly tell me where the remaining answer can be found. Avogadro's number = $6.022 \times 10^{23}$	ur work, I
	MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the cr question, 22 pts pts total)	uestion. (2
	1) Determine the name for N <sub>2</sub> O <sub>5</sub> .  A) nitrogen (II) oxide B) nitrogen (IV) oxide C) nitrogen tetroxide D) dinitrogen pentoxide E) nitrogen oxide  (50.0/1000)	1) <u>D</u>
	2) Determine the molarity of a solution formed by dissolving 0.468 g of MgI <sub>2</sub> in enough water to yield 50.0 mL of solution. (formula weight MgI <sub>2</sub> = 278.11 g/mol)  A) 0.0651 M B) 0.0936 M C) 0.0337 M D) 0.0297 M E) 0.0107 M	2)
	3) Give the correct formula for aluminum sulfate.  A) Al <sub>3</sub> (SO <sub>4</sub> ) <sub>2</sub> B) Al(SO <sub>4</sub> ) <sub>3</sub> C) Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> D) Al <sub>2</sub> SO <sub>4</sub> 4) Which of the following solutions will have the highest concentration of chloride ions?  A) 0.40 M CaCl <sub>2</sub> B) 0.40 M MgCl <sub>2</sub> C) 0.20 M LiCl  D) 0.60 M AlCl <sub>3</sub> E) All of these solutions have the same concentration of chloride ions.	4)
	5) Which one of the following is <b>not</b> an empirical formula? (Owest Value)  A) CHO  B) CH <sub>2</sub> O  C) C <sub>2</sub> H <sub>4</sub> O  D) C <sub>2</sub> H <sub>4</sub> O <sub>2</sub> (2)	5)
	6) Identify HCl.  A) weak electrolyte, strong acid B) strong electrolyte, weak acid C) strong electrolyte, strong acid D) weak electrolyte, weak acid E) nonelectrolyte, not acid	6)
	7) Calculate the molar mass of Al(C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> ) <sub>3</sub> .  A) 258.09 g/mol  B) 56.00 g/mol  C) 86.03 g/mol  D) 139.99 g/mol  E) 204.13 g/mol  E) 204.13 g/mol	n <u>C</u> 204,1



- 9) Determine the oxidation state of C in CO<sub>3</sub>-2. A)-4B) +6D) -2E) +210) How many H+ ions can the acid, H2SO4, donate per molecule? A) 0 B) 3 D) 1
- 11) According to the following balanced reaction, how many moles of KO are required to exactly react with 5.44 moles of H<sub>2</sub>O?

A) 1.36 moles 
$$\frac{120}{10.9}$$
B) 10.9 moles  $\frac{1420}{10.9}$ 
C) 2.72 moles  $\frac{1420}{10.9}$ 
D) 5.44 moles  $\frac{1420}{10.9}$ 
E) 21.8 moles  $\frac{1420}{10.9}$ 
WD

D) 5.44 moles HyO E) 21.8 moles H<sub>2</sub>O

 $4 \text{ KO(s)} + 2 \text{ H}_2\text{O(l)} \rightarrow 4 \text{ KOH(s)} + \text{O}_2(g)$ 

$$(+3(-2) = -2$$
  
 $(-2) = -2$ 

statement or ans show work, you	wers the question. Som	or phrase or circle the choice that best completes each e questions may require that you show work. If you do not questions which do not require work, if you legibly should pts )	not ow
pts, 2 pts each)		estion by either providing the name or providing the formula $Q$	ı. (4
# prefix for 6	hexa	acetate CH3-E-8	

Balance the following reaction by filling in the blank with a number. The number may be the number one or any other number. The parts without a blank do not need any numbers input to balance the equation. (4 pts, 2 pts each)

$$K_2SO_4(aq) + CaI_2(aq) \rightarrow$$
 CaSO<sub>4</sub>(s) + 2 KI (aq)

NEVA

For your reaction to work, if you need 7.25 moles of LiOH and you have a 0.255 M solution 3 of the of LiOH in water, how many mL of the LiOH solution do you need? To answer this question, complete the following expression by filling in the 4 parenthesis below with numbers. (8 pts, 2 pts each)

$$(1.25)$$
 mol Li OH \*  $(100)$  ml LiOH soln.=  $(28431)$  mL of of LiOH solution  $(0.255)$  mol LiOH  $(2.84 \times 10^{4})$ 

The following molecule is (soluble) or (insoluble)] (circle one) in water. (4 pts) 4.

Complete the following precipitation reaction by filling in each blank with an ion or molecule. (7 pts, 1 pt each)

molecular equation

$$(Mg Cl_2 + Ca(OH)) \rightarrow (aq) + Mg (OH)_2 (s)$$

ionic equation

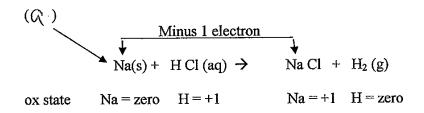
$$Mg^{+2}(aq) + 2U - (aq) + Ca^{+2}(aq) + 2U - (aq) + 2U - (aq) + 2U - (aq) + Mg(OH)_2(s)$$

Net ionic equation

6. Circle the following which are strong acids.(5 pts)

(H<sub>2</sub>SO<sub>2</sub>) H F (HNO<sub>2</sub>) CH₃COOH

7. For the following redox reaction, fill in the parenthesis by the reagent with either the letter (a) or (b). (a) is being oxidized (b) is being reduced (4 pts)



8. What is the pressure of nitrogen if the total pressure of  $O_2$  (g) and  $N_2$  (g) is 780 torr and the pressure of  $O_2$  is 38 torr? (show work) (8 pts)

a. Given the reaction below, what is the theoretical yield of CO<sub>2</sub> in grams if you start out with 35.7 grams of CH<sub>4</sub> (FW of CO<sub>2</sub> = 44.01 g/mol, FW of CH<sub>4</sub> 16.05 g/mol) Assume excess amount of the other reactant. (show work) (15 pts)

 $CH_4(g) + 2 O_2(g) \rightarrow CO_2(g) + H_2O(g)$ 

b. If the number of grams of the  $CO_2$  based on the amount of  $O_2$  is 25 grams, what is the limiting reagent?  $\{[CH_4] \text{ or } [O_2]\}\$  (circle one) (3 pts)

35,7g CH4 -> 97,9g CU OL -> 25g COL

If you have 1.5 moles of a gas at pressure 1.05 atm occupying a volume of 2.5 liters, what is the temperature? [PV = nRT, R=0.08206 (L atm)/(mol K)] (I made up these numbers so the numbers have no relation to reality.) (show work) (15 pts)

$$N = 1.0 \text{ mod}$$

$$P = 1.05 \text{ atm}$$

$$V = 2.51$$

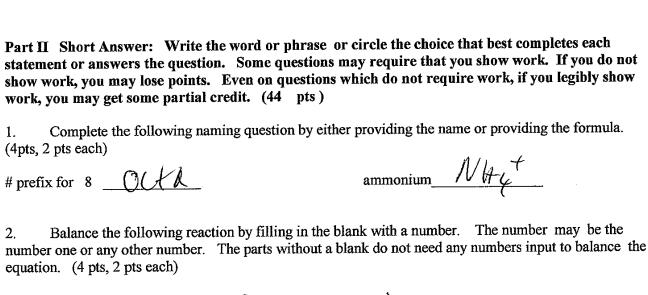
$$T = 7$$

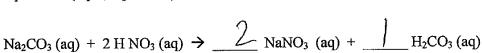
$$T = \frac{PV}{nR} = \frac{(.05 \text{ atm})(2.5\%)}{(1.50)(0.08206 \text{ latm})}$$

$$\frac{1.50}{mod} = \frac{(0.08206 \text{ latm})}{mod}$$

									green Exam#	_	
Exam	п	General Chem	istry I Lecture	Fall 2013	10/21/13	Monday	10:30 B	Dr. Hahn	Exam # _		
Name_		1cer	<i>Y</i>		(print) Na	me				_(sign	ı)
choice obviou	que sly	ow work for par estions have no cannot grade it clearly tell me	tial credit and f partial credit. . (1 pts print ar	full credit or Please wri nd sign exan	n the Long A ite anything n) If you	Answers a you want run out o	nd in some graded leg f space, pl	of the Short gibly. If I ease continu	Answer Ques cannot read you e on the back	our wo	rk, I
		ULTIPLE CHC restion, 22 pts p		he one alter	rnative that	best com	pletes the	statement or	answers the	questi	on. (2
pto per	-	Identify acetic A) weak elec B) weak elec C) strong ele D) strong ele		acid cid acid						1) _	<u>B</u>
	2)	Give the name A) nitrous ac B) nitric acid C) hydroger D) hydroger E) hydroger	cid I I nitrate I nitride							2) _	<u>(}</u>
	3)	What is the em A) Hg4(NO( B) Hg2(NO( C) Hg2NO3 D) Hg(NO3) E) HgNO3	3)4 3)2	for Hg <sub>2</sub> (NO	O <sub>3)2</sub> ?					3) _	E
	4)	Determine the A) 0	oxidation state B) +2	of P in PO3	3- <sub>.</sub> C) +3		D) +6	1	E) -3	4) _	<u>C</u>
	5)	B) MgSO <sub>4</sub> (a C) 2 HClO <sub>4</sub> D) Fe(s) + 2	ollowing is an angle (g) $\rightarrow$ CO <sub>2</sub> (g) and $\rightarrow$ Ba(NO <sub>3</sub> ) <sub>2</sub> (aq) + Ba(OH) <sub>2</sub> (aq) $\rightarrow$ 2 AgNO <sub>3</sub> (aq) $\rightarrow$ 2 the above are accompany $\rightarrow$ 2 and $\rightarrow$ 2 and $\rightarrow$ 2 and $\rightarrow$ 3 and $\rightarrow$ 2 and $\rightarrow$ 3 and $\rightarrow$ 4 and $\rightarrow$ 3 and $\rightarrow$ 4 an	(aq) → Mg(l (aq) → 2 H <sub>2</sub> 2 Ag(s) + Fe	NO3)2(aq) + O(1) + Ca(C (NO3)2(aq)	- BaSO <sub>4</sub> (s)				5) _	<u>C</u> _

6) Calculate the molar m A) 223.21 g/mol B) 247.52 g/mol C) 123.76 g/mol D) 119.52 g/mol	ass for Mg(ClO4)2	2.			6)
E) 75.76 g/mol  7) Which of the following	r colutions will be	we the highest concent	ration of chloride i	ons?	7) B
A) 0.05 M CaCl <sub>2</sub>	g solutions will ha	ive the ingress concern	ration or emoriae		·/
B) 0.10 M AlCl <sub>3</sub>					
C) 0.10 M LiCl					
D) 0.10 M MgCl <sub>2</sub>			. 1 •		
E) All of these solut	tions have the sam	ne concentration of chlo	oride ions.		<i>A</i>
8) Determine the name for	or PaOro				8)
A) tetraphosphorus					, <del></del> _
B) phosphorus (IV)					
C) diphosphorus pe					
D) phosphorus oxid					
E) phosphorus (II)	oxide				$\circ$
9) How many H+ ions ca	n the acid. H2SO4	1 , donate per molecule	?		9)
A) 0	B) 1	C) 2		D) 3	
10) Determine the molarit	y of a solution for	med hy dissolving 97 5	7 o LiBr in enough	water to vield	10)
750.0 mL of solution.		LiBr = $86.84 \text{ g/mol}$	8	···	
A) 0.130 M	B) 0.768 M	C) 2.30 M	D) 1.18 M	E) 1.50 M	
			(1/()	- 1 t etl was at	11)
11) According to the followith 5.44 moles of H <sub>2</sub>		iction, now many mole	s or KO are requir	ed to exactly react	11)
Will O. II III OLO OI X.Z.					
4 KO(s) + 2 H	$_2O(1) \rightarrow 4 \text{ KOH}(3)$	s) + O <sub>2</sub> (g)			
A) 2.72 moles H20	Ka				
B) 21.8 moles H2O					
C) 5.44 moles H <sub>2</sub> O					
D) 1.36 moles H2O	ĸň				
E) 10.9 moles H <sub>2</sub> O	V)				





3. For your reaction to work, if you need 2.77 moles of H NO<sub>3</sub> and you have a 0.555 M solution of the of HNO<sub>3</sub> in water, how many mL of the HNO<sub>3</sub> solution do you need? To answer this question, complete the following expression by filling in the 4 parenthesis below with numbers. (8 pts, 2 pts each)

$$(2.77) \text{ mol H NO}_3 * \frac{(000)}{(0.555)} \text{ mol HNO}_3 \text{ soln} = (4990.99) \text{ mL HNO}_3 \text{ solution}$$

$$(0.555) \text{ mol HNO}_3 \qquad (4990.99) \text{ mL HNO}_3 \text{ solution}$$
4. The following molecule is ((soluble) or (insoluble)) (circle one) in water. (4 pts)

4. The following molecule is ((soluble) or (insoluble)] (circle one) in water. (4 pts)

LiOH

Color in soluble is (soluble) but all all metals are

Colored in soluble

5. Complete the following precipitation reaction by filling in each blank with an ion or molecule. (7 pts, 1 pt each)

molecular equation

$$Sr Cl_2 + Na_2 SO_4 \rightarrow 2 N(1 - (aq) + Sr SO_4 (s)$$

ionic equation

$$Sr^{+2}(aq) + 2Cl^{-}(aq) + 2Na^{+}(aq) + SO_4^{-2} \rightarrow 2Na^{+}(aq) + 2Cl^{-}(aq) + Sr SO_4(s)$$

Net ionic equation

$$\frac{\int_{\Gamma}^{+1} (aq) + \frac{\int_{\Gamma}^{-1} (aq)}{\int_{\Gamma}^{-1} (aq)} \Rightarrow \operatorname{Sr} SO_{4}(s)$$

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6. Circle the following which are weak acids. (5 pts)

 $HNO_3$  HCI  $CH_3COOH$   $H_2SO_4$ 

7. For the following redox reaction, fill in the parenthesis by the reagent with either the letter (a) or (b). (a) is being oxidized (b) is being reduced (4 pts)

8. What is the pressure of nitrogen if the total pressure of  $O_2$  (g) and  $N_2$  (g) is 1.1 atm and the pressure of  $O_2$  is 0.2 atm? (show work) (8 pts)

 $P_{kotal} = P_{02} + P_{N2}$  I.Iatm = 0.2 atm  $P_{N2} = P_{tot} - P_{02} = I.Iatm - 0.2atm$   $P_{NL} = 0.9atm$ 

a. Given the reaction below, what is the theoretical yield of KOH in grams if you start out with 24.8 grams of KO (FW of KOH = 56.11 g/mol FW of KO 55.10 g/mol) Assume excess amount of the other reactant. (show work) (15 pts)

 $4 \text{ KO (s)} + 2 \text{ H}_2\text{O (l)} \rightarrow 4 \text{ KOH (s)} + \text{O}_2 \text{ (g)}$ 

= 25.7 g KOH

b. If the number of grams of the KOH based on the amount of H<sub>2</sub>O is 30.5 grams, what is the limiting reagent?

[KO] or [H<sub>2</sub>O]} (circle one) (3 pts)

100 -> 25,3gk04 120-> 30.5gk04

2. If you have a gas at pressure 0.57 atm at a temperature of 285 K for a 2.0 mole sample of gas, what is the volume? [PV = nRT, R=0.08206 (L atm)/(mol K)] (I made up these numbers so the numbers have no relation to reality.) (show work) (15 pts)

$$P = 0.57atm$$

$$T = 285K$$

$$N = 2.0mol$$

$$V = ?$$

$$PV = NRT$$

$$V = \frac{nRT}{P}$$

$$V = (2.0mol)(0.08201 latm)(285K)$$

$$V = 82.1 l$$

Name				(print) Name			(sign)
_							Ducetions Multin
Please	sho	w work for partial cr stions have no partia	edit and full credit Loredit — Please v	on the Long Ansv vrite anything vol	vers and in some or i 1 want graded legibl	y. If I cannot rea	d your work, I
choice obviou	que slv	cannot grade it. (1 p	ts print and sign ex	am) If you rur	out of space, please	e continue on the b	ack page of the
exam a	nd	clearly tell me where	the remaining answ	wer can be found.	Avogadro's numbe	$r = 6.022 \times 10^{23}$	
Part I	M	ULTIPLE CHOICE.	Choose the one al	ternative that bes	t completes the stat	ement or answers	the question. (2
		estion, 22 pts pts tot					
	1)	What is the empirica	l formula for Hg2(I	NO3)2?			1)
		A) Hg <sub>2</sub> NO <sub>3</sub>					
		B) Hg4(NO3)4					
		C) Hg <sub>2</sub> (NO <sub>3</sub> ) <sub>2</sub>					
		D) Hg(NO3)2					
		E) HgNO3					
	2)	Which of the followi	ng solutions will ha	ave the highest co	ncentration of chlori	de ions? 9	2)
	-,	A) 0.10 M AlCl <sub>3</sub>	. 0 -	Ü			
		B) 0.10 M LiCl					
		C) 0.10 M MgCl <sub>2</sub>					
		D) 0.05 M CaCl <sub>2</sub>					
		E) All of these sol	utions have the san	ne concentration (	of chloride ions.		
	3)	Determine the oxida	tion state of P in PC	) <sub>3</sub> 3			3)
	•	A) +2	B) 0	C) +3	D) -3	E) +6	
	4)	Calculate the molar	mass for Mg(ClO4)	2.			4)
	-,	A) 119.52 g/mol	<b>3</b> ( 1)	<b>-</b>			
		B) 75.76 g/mol					
		C) 123.76 g/mol					
		D) 223.21 g/mol					
		E) 247.52 g/mol					
	5)	Determine the name	for P4O <sub>10</sub> .				5)
		A) phosphorus (P					
		B) tetraphosphore					
		C) diphosphorus					
		D) phosphorus ox	aue				

6) Give the name for HN A) nitric acid B) hydrogen nitrate C) hydrogen nitride D) nitrous acid E) hydrogen nitrite	•				6)
7) How many H+ ions ca A) 2	n the acid, H2SO4 B) 0	, donate per molecule C) 3		D) 1	7)
8) Determine the molarit 750.0 mL of solution.	y of a solution for: (formula weight	med by dissolving 97.7 LiBr = 86.84 g / mol)			8)
A) 1.18 M	B) 1.50 M	C) 0.130 M	D) 2.30 M	E) 0.768 M	
9) Identify acetic acid. (					9)
A) strong electrolyte, n B) nonelectrolyte, n C) weak electrolyte, D) strong electrolyte, E) weak electrolyte,	ot acid , strong acid e, weak acid		,		
,	s(aq) → 2 Ag(s) + F Ca(OH)2(aq) → 2 H (NO3)2(aq) → Mg CO2(g)	ie(NO3)2(aq) H2O(1) + Ca(CIO4)2(aq) i(NO3)2(aq) + BaSO4(s			10)
11) According to the followith 5.44 moles of H <sub>2</sub>		ction, how many mole	s of KO are requi	red to exactly react	11)
4 KO(s) + 2 H	2O(i) → 4 KOH(s	s) + O <sub>2</sub> (g)			
A) 21.8 moles H <sub>2</sub> O B) 5.44 moles H <sub>2</sub> O C) 2.72 moles H <sub>2</sub> O D) 1.36 moles H <sub>2</sub> O E) 10.9 moles H <sub>2</sub> O	1C0 1C0 1C0				

statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit. (44 pts)
1. Complete the following naming question by either providing the name or providing the formula. (4 pts, 2 pts each)
# prefix for 4 sulfate
2. Balance the following reaction by filling in the blank with a number. The number may be the number one or any other number. The parts without a blank do not need any numbers input to balance the equation. (4 pts, 2 pts each)
$2 \text{ KI (aq)} + \text{Pb(NO}_3)_2 \text{ (aq)} \rightarrow \underline{\qquad} \text{PbI}_2 \text{ (s)} + \underline{\qquad} \text{KNO}_3 \text{ (aq)}$
3. For your reaction to work, if you need 5.78 moles of NaOH and you have a 1.02 M solution of the of NaOH in water, how many mL of the NaOH solution do you need? To answer this question, complete the following expression by filling in the 4 parenthesis below with numbers. (8 pts, 2 pts each)
() mol Na OH * ml NaOH soln = () mL NaOH solution
() mol NaOH
4. The following molecule is [(soluble) or (insoluble)] (circle one) in water. (4 pts)
$\mathrm{Hg_2SO_4}$
5. Complete the following precipitation reaction by filling in each blank with an ion or molecule. (7pts 1 pt each)
molecular equation
$Na_2 S (aq) + Mg (NO_3)_2 \rightarrow \underline{\qquad} (aq) + Mg S (s)$
ionic equation
$2 \text{ Na}^+(aq) + \underline{\qquad}(aq) + \text{Mg}^{+2}(aq) + \underline{\qquad}(aq) + \underline{\qquad}(aq) + \underline{\qquad}(aq) + \underline{\qquad}(aq) + \text{Mg S (s)}$
Net ionic equation
$\underline{\hspace{1cm}}(aq) + \underline{\hspace{1cm}}(aq) \rightarrow MgS (s)$
Dr. Hahn General Chemistry I Lecture Exam II Fall 2013 form (9:30 A) page 3

Part II Short Answer: Write the word or phrase or circle the choice that best completes each

6. Circle the following which are strong bases. (5 pts)

NH₄ OH

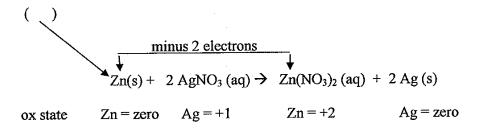
LiOH

 $NH_3$ 

NaOH

Sr (OH)<sub>2</sub>

7. For the following redox reaction, fill in the parenthesis by the reagent with either the letter (a) or (b). (a) is being oxidized (b) is being reduced (4 pts)



8. If you collect oxygen gas being generated in a reaction under water, if the total pressure is 1.3 atm and the water pressure is 0.2 atm, what is the pressure of the oxygen ? (show work) (8 pts)

- 1. a. Given the reaction below, what is the theoretical yield of  $PbCl_2$  in grams if you start out with 87.2 grams of KCl (FW of  $PbCl_2 = 278.20$  g/mol, FW of KCl 74.60 g/mol) Assume excess amount of the other reactant. (show work) (15 pts)
- $2 \text{ KCl (aq)} + \text{Pb(NO}_3)_2 \text{ (aq)} \rightarrow \text{PbCl}_2 \text{ (s)} + 2 \text{ KNO}_3 \text{ (aq)}$

b. If the number of grams of the PbCl<sub>2</sub> based on the amount of Pb(NO<sub>3</sub>)<sub>2</sub> is 200.5 grams, what is the limiting reagent? (Corpare to yield about)

 $\{ [KC1] \text{ or } [Pb(NO_3)_2] \} \text{ (circle one) (3 pts)}$ 

You have a mixture of gases with a pressure of 1.1 atm. in a container of volume 2.5 L at 275 K. If the new temperature is 305 K at a pressure of 0.97 atm, what is the volume ?  $(P_1V_1)/(P_2V_2) = T_1/T_2$  (I made up these numbers so that the numbers have no relation to reality.) (show work) (15 pts)

Exam 1	II General Chemistry I	Lecture Fall 2013	3 10/21/13 Monday 9:	30 B Dr. Hahn Exam#	5-2
Name_			(print) Name		(sign)
choice c	questions have no partial Bly cannot grade it. (1 pts	credit. Please v print and sign ex	vrite anything you want gr am)	in some of the Short Answer Q aded legibly. If I cannot rea bace, please continue on the b ro's number = $6.022 \times 10^{23}$	d your work, I
	MULTIPLE CHOICE. Cquestion, 22 pts pts total		ternative that best comple	tes the statement or answers t	he question. (2
	1) According to the followith 5.44 moles of H <sub>2</sub>		action, how many moles of	KO are required to exactly rea	ct 1)
	4 KO(s) + 2 H	2O(l) → 4 KOH(	(s) + O <sub>2</sub> (g)		
	A) 5.44 moles H2O B) 21.8 moles H2O C) 10.9 moles H2O D) 1.36 moles H2O E) 2.72 moles H2O	KO KO			
	2) How many H+ ions ca A) 2	nn the acid, H2SO B) 3	4 , donate per molecule? C) 0	D) 1	2)
	3) Calculate the molar m A) 75.76 g/mol B) 119.52 g/mol C) 247.52 g/mol D) 223.21 g/mol E) 123.76 g/mol	ass for Mg(ClO4)	2.		3)
	4) What is the empirical A) Hg(NO <sub>3</sub> ) <sub>2</sub> B) Hg <sub>2</sub> (NO <sub>3</sub> ) <sub>2</sub> C) HgNO <sub>3</sub> D) Hg <sub>4</sub> (NO <sub>3</sub> ) <sub>4</sub> E) Hg <sub>2</sub> NO <sub>3</sub>	formula for Hg <sub>2</sub> (	NO <sub>3</sub> ) <sub>2</sub> ?		4)
	5) Determine the oxidati A) 0	on state of P in PO B) +3	-	e) +2 E) +6	5)

6) Give the name for HNO3.					6)
A) nitrous acid					
B) hydrogen nitri					
C) hydrogen nitri					
D) hydrogen nitra E) nitric acid	ate				
Ly lattic acid					
7) Determine the name for $P_4O_{10}$ .					7)
A) phosphorus (I					
B) diphosphorus					
C) phosphorus (I					
D) tetraphosphor E) phosphorus o					
E) priospriorus o	Aide				
8) Determine the mola	rity of a solution for	rmed by dissolving	97.7 g LiBr in enough	water to yield	8)
750.0 mL of solution					,
A) 0.130 M	B) 0.768 M	C) 1.18 M	D) 2.30 M	E) 1.50 M	
9) Identify acetic acid. (CH <sub>3</sub> COOH)					9)
A) weak electroly					
B) strong electrol					
C) weak electroly D) strong electrol					
E) nonelectrolyte					
E) Horicicciory ic	, not ucia				
10) Which of the following is an acid-base reaction?					10)
	$O_3(aq) \rightarrow 2 Ag(s) +$				
B) 2 HClO4(aq)	$Ca(OH)_2(aq) \rightarrow 2$	$H_2O(1) + Ca(ClO_4)_2$	(aq)		
C) $MgSO_4(aq) +$	$Ba(NO_3)_2(aq) \rightarrow M$	g(NO3)2(aq) + BaS(	O4(s)		
D) $C(s) + O_2(g) -$	→ CO <sub>2</sub> (g)				
E) None of the al	oove are acid base r	eactions.			
44) YATUS L. COL. C. U		ave the highest com	contration of chlorida	ione?	11)
<ol> <li>Which of the follow</li> <li>A) 0.10 M LiCl</li> </ol>	ing solutions will n	ave the nighest con-	zentration of Chioride	ions:	11)
B) 0.05 M CaCl <sub>2</sub>					
C) 0.10 M MgCl <sub>2</sub>					
D) 0.10 M AlCl <sub>3</sub>					
,	lutions have the sar	ne concentration of	chloride ions.		
,					

statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit. (44 pts)
1. Complete the following naming question by either providing the name or providing the formula. (4 pts, 2 pts each)
# prefix for 5 nitrate
2. Balance the following reaction by filling in the blank with a number. The number may be the number one or any other number. The parts without a blank do not need any numbers input to balance the equation. (4 pts, 2 pts each)
$H_2SO_4$ (aq) + 2 NaOH (aq) $\rightarrow$ Na <sub>2</sub> SO <sub>4</sub> (aq) + H <sub>2</sub> O
3. For your reaction to work, if you need 8.23 moles of HCl and you have a 2.00 M solution of the of HCl in water, how many mL of the HCl solution do you need? To answer this question, complete the following expression by filling in the 4 parenthesis below with numbers. (8 pts, 2 pts each)
() mol H Cl * ml H Cl soln = () mL of HCl solution
() mol HCl
4. The following molecule is [(soluble) or (insoluble)] (circle one) in water. (4 pts)
$(NH_4)_2S$
5. Complete the following precipitation reaction by filling in each blank with an ion or molecule. (7 pts 1 pt each)
molecular equation
$(NH_4)_3PO_4 (aq) + 3 AgNO_3 (aq) \rightarrow $ (aq) + Ag <sub>3</sub> PO <sub>4</sub> (s)
ionic equation
$3 \text{ NH}_{4}^{+}(aq) + \underline{\qquad} (aq) + \underline{\qquad} (aq) + \underline{\qquad} (aq) + Ag_{3}PO_{4}(s)$
Net ionic equation
$\underline{\qquad} (aq) + \underline{\qquad} (aq) \rightarrow Ag_3 PO_4 (s)$
Dr. Hahn General Chemistry I. Lecture Exam II. Fall 2013 form (9:30 B) page 3

Part II Short Answer: Write the word or phrase or circle the choice that best completes each

6. Circle the following which are weak bases (5 pts)

Na OH

 $NH_3$ 

Ba (OH)<sub>2</sub>

NH4 OH

KOH

For the following redox reaction, fill in the parenthesis by the reagent with either the letter (a) or (b).

(a) is being oxidized (b) is being reduced (4 pts)

$$Zn(s) + 2 AgNO3 (aq) \rightarrow Zn(NO3)2 (aq) + 2 Ag (s)$$
ox state  $Zn = zero$   $Ag = +1$   $Zn = +2$   $Ag = zero$ 

8. If you collect oxygen gas being generated in a reaction under water, if the total pressure is 775 mm Hg and the water pressure is 26 mm Hg what is the pressure of the oxygen? (show work) (8 pts)

1. a. Given the reaction below, what is the theoretical yield of Ag in grams if you start out with 77.9 grams of  $AgNO_3$  (FW of Ag = 107.87 g/mol, FW of  $AgNO_3$  169.88 g/mol) Assume excess amount of the other reactant. (show work) (15 pts)

 $Zn(s) + 2 AgNO_3(aq) \rightarrow Zn(NO_3)_2(aq) + 2 Ag(s)$ 

b. If the number of grams of the Ag based on the amount of Zn is 25 g, what is the limiting reagent? (Coh pare + 0 above) {[Zn] or [AgNO<sub>3</sub>]} (circle one) (3 pts)

You have a mixture of gases in a volume of 0.75 liters at pressure 1.4 atm at an unknown temperature. 2 If the new volume is 1.8 liters at pressure 0.7 atm and temperature of 298.5 K, what is the old unknown temperature?  $(P_1V_1)/(P_2V_2) = T_1/T_2$  (I made up these numbers so that the numbers have no relation to reality.) (show work) (15 pts)

Exam 1	I General Chemistry I Lecture Fall 2013 10/21/13 Monday 10:30 A Dr. Hahn Exam #	
Name_	(print) Name	_(sign)
choice q obvious exam ar	now work for partial credit and full credit on the Long Answers and in some of the Short Answer Questuestions have no partial credit. Please write anything you want graded legibly. If I cannot read you want grade it. (1 pts print and sign exam) If you run out of space, please continue on the back d clearly tell me where the remaining answer can be found. Avogadro's number = $6.022 \times 10^{23}$	page of the
	MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question, 22 pts pts total)	question. (2
	1) Determine the name for N <sub>2</sub> O <sub>5</sub> .	1)
	A) nitrogen (II) oxide B) nitrogen (IV) oxide C) nitrogen tetroxide D) dinitrogen pentoxide E) nitrogen oxide	
	2) Determine the molarity of a solution formed by dissolving 0.468 g of MgI2 in enough water to	2)
	yield 50.0 mL of solution. (formula weight MgI <sub>2</sub> = 278.11 g/mol)	,
	A) 0.0651 M B) 0.0936 M C) 0.0337 M D) 0.0297 M E) 0.0107 M	
	, , , , , , , , , , , , , , , , , , , ,	
	3) Give the correct formula for aluminum sulfate.	3)
	A) Al <sub>3</sub> (SO <sub>4</sub> ) <sub>2</sub> B) Al(SO <sub>4</sub> ) <sub>3</sub> C) Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> D) Al <sub>2</sub> SO <sub>4</sub>	
	<ul> <li>4) Which of the following solutions will have the highest concentration of chloride ions? <ul> <li>A) 0.40 M CaCl<sub>2</sub></li> <li>B) 0.40 M MgCl<sub>2</sub></li> <li>C) 0.20 M LiCl</li> <li>D) 0.60 M AlCl<sub>3</sub></li> <li>E) All of these solutions have the same concentration of chloride ions.</li> </ul> </li> </ul>	4)
		5)
	5) Which one of the following is <b>not</b> an empirical formula?  A) CHO  B) CH2O  C) C2H4O  D) C2H4O2	J)
	A) CHO B) CH <sub>2</sub> O C) C <sub>2</sub> H <sub>4</sub> O D) C <sub>2</sub> H <sub>4</sub> O <sub>2</sub>	
	6) Identify HCl. A) weak electrolyte, strong acid B) strong electrolyte, weak acid C) strong electrolyte, strong acid D) weak electrolyte, weak acid E) nonelectrolyte, not acid	6)
	7) Calculate the molar mass of Al(C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> ) <sub>3</sub> .	<i>7</i> )
	A) 258.09 g/mol B) 56.00 g/mol C) 86.03 g/mol D) 139.99 g/mol E) 204.13 g/mol	

8) Which of the following is an acid-base reaction?  A) Fe(s) + 2 AgNO <sub>3</sub> (aq) → 2 Ag(s) + Fe(NO <sub>3</sub> ) <sub>2</sub> (aq)  B) MgSO <sub>4</sub> (aq) + Ba(NO <sub>3</sub> ) <sub>2</sub> (aq) → Mg(NO <sub>3</sub> ) <sub>2</sub> (aq) + BaSO <sub>4</sub> (s)  C) 2 HClO <sub>4</sub> (aq) + Ca(OH) <sub>2</sub> (aq) → 2 H <sub>2</sub> O(l) + Ca(ClO <sub>4</sub> ) <sub>2</sub> (aq)  D) C(s) + O <sub>2</sub> (g) → CO <sub>2</sub> (g)  E) None of the above are acid base reactions.				8)	
9) Determine the ox	cidation state of C in	CO <sub>3</sub> -2.			9)
	B) +6		D) -2	E) +2	
10) How many H+ i	ons can the acid, H <sub>2</sub> S	604 , donate per mo	lecule?		10)
A) 0	В) 3	. C)		D) 1	
11) According to the with 5.44 moles		reaction, how many	moles of KO are re	quired to exactly react	11)
4 KO(s)	+2 H <sub>2</sub> O(l) → 4 KO	H(s) + O <sub>2</sub> (g)			
A) 1.36 moles	H2O KO				
B) 10.9 moles	H20 1C0				
C) 2.72 moles					
D) 5.44 moles					
E) 21.8 moles	HZO KO				

Part II Short Answer: Write the word or phrase or circle the choice that best completes each statement or answers the question. Some questions may require that you show work. If you do not show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit. (44 pts)
1. Complete the following naming question by either providing the name or providing the formula. (4 pts, 2 pts each)
# prefix for 6 acetate
2. Balance the following reaction by filling in the blank with a number. The number may be the number one or any other number. The parts without a blank do not need any numbers input to balance the equation. (4 pts, 2 pts each)
$K_2SO_4$ (aq) + $CaI_2$ (aq) $\rightarrow$ $CaSO_4$ (s) + $KI$ (aq)
For your reaction to work, if you need 7.25 moles of LiOH and you have a 0.255 M solution of the of LiOH in water, how many mL of the LiOH solution do you need? To answer this question, complete the following expression by filling in the 4 parenthesis below with numbers. (8 pts, 2 pts each)
() mol Li OH * ml LiOH soln.= () mL of of LiOH solution () mol LiOH
4. The following molecule is [(soluble) or (insoluble)] (circle one) in water. (4 pts)
Mg(NO <sub>3</sub> ) <sub>2</sub>
5. Complete the following precipitation reaction by filling in each blank with an ion or molecule. (7 pts, 1 pt each)
molecular equation
$Mg Cl_2 + Ca(OH)_2 \rightarrow$ (aq) + $Mg (OH)_2 (s)$
ionic equation
$Mg^{+2}(aq) + \underline{\qquad} (aq) + Ca^{+2}(aq) + \underline{\qquad} (aq) + $
Net ionic equation
$\underline{\hspace{1cm}}$ (aq) + $\underline{\hspace{1cm}}$ (aq) $\rightarrow$ Mg (OH) <sub>2</sub> (s)
Dr. Hahn General Chemistry I Lecture Exam II Fall 2013 form (10:30 A) page 3

6. Circle the following which are strong acids.(5 pts)

ΗΙ

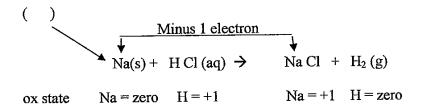
 $H_2SO_4$ 

HF

HNO<sub>3</sub>

CH<sub>3</sub>COOH

7. For the following redox reaction, fill in the parenthesis by the reagent with either the letter (a) or (b). (a) is being oxidized (b) is being reduced (4 pts)



8. What is the pressure of nitrogen if the total pressure of  $O_2$  (g) and  $N_2$  (g) is 780 torr and the pressure of  $O_2$  is 38 torr? (show work) (8 pts)

Dr. Hahn

Part III. Long Answer Please show work for full credit and to receive partial credit. (33 pts) \*\*\*\* Please attempt every problem for partial credit. You will get no partial credit if you just rewrite the question with no change in anything.\*\*\*\*

a. Given the reaction below, what is the theoretical yield of CO<sub>2</sub> in grams if you start out with 35.7 grams of CH<sub>4</sub> (FW of CO<sub>2</sub> = 44.01 g/mol, FW of CH<sub>4</sub> 16.05 g/mol) Assume excess amount of the other reactant. (show work) (15 pts)

 $CH_4(g) + 2 O_2(g) \rightarrow CO_2(g) + H_2O(g)$ 

b. If the number of grams of the CO<sub>2</sub> based on the amount of O<sub>2</sub> is 25 grams, what is the limiting reagent?

(Compare to above)  ${[CH_4] or [O_2]}$  (circle one) (3 pts)

If you have 1.5 moles of a gas at pressure 1.05 atm occupying a volume of 2.5 liters, what is the temperature? [PV = nRT, R=0.08206 (L atm)/(mol K)] (I made up these numbers so the numbers have no relation to reality.) (show work) (15 pts)

Dr. Hahn

Exam II	General Chemistry I Lecture Fall 20	13 10/21/13 Mor	nday 10:30 B Dr.	Hahn Exam	3-11
Name		(print) Name_			(sign)
choice que obviously	ow work for partial credit and full cred estions have no partial credit. Please cannot grade it. (1 pts print and sign of clearly tell me where the remaining an	e write anything you exam) If you run	want graded legibly out of space , please	y. If I cannot read continue on the b	d your work, l
	IULTIPLE CHOICE. Choose the one a nestion, 22 pts pts total)	alternative that best	t completes the state	ement or answers t	he question. (2
1)	Identify acetic acid. (CH <sub>3</sub> COOH) A) weak electrolyte, strong acid B) weak electrolyte, weak acid C) strong electrolyte, weak acid D) strong electrolyte, strong acid E) nonelectrolyte, not acid				1)
2)	Give the name for HNO3.  A) nitrous acid B) nitric acid C) hydrogen nitrate D) hydrogen nitride E) hydrogen nitrite				2)
3)	What is the empirical formula for Hg <sub>2</sub> A) Hg <sub>4</sub> (NO <sub>3</sub> ) <sub>4</sub> B) Hg <sub>2</sub> (NO <sub>3</sub> ) <sub>2</sub> C) Hg <sub>2</sub> NO <sub>3</sub> D) Hg(NO <sub>3</sub> ) <sub>2</sub> E) HgNO <sub>3</sub>	<u>)(</u> NO <sub>3</sub> ) <sub>2</sub> ?			3)
4)	Determine the oxidation state of P in I A) 0 B) +2	PO3 <sup>3-</sup> C) +3	D) +6	E) -3	4)
5)	<ul> <li>Which of the following is an acid-base A) C(s) + O<sub>2</sub>(g) → CO<sub>2</sub>(g)</li> <li>B) MgSO<sub>4</sub>(aq) + Ba(NO<sub>3</sub>)<sub>2</sub>(aq) → N</li> <li>C) 2 HClO<sub>4</sub>(aq) + Ca(OH)<sub>2</sub>(aq) → 2</li> <li>D) Fe(s) + 2 AgNO<sub>3</sub>(aq) → 2 Ag(s)</li> <li>E) None of the above are acid base</li> </ul>	Mg(NO3)2(aq) + BaS 2 H2O(l) + Ca(ClO4) + Fe(NO3)2(aq)			5)

Exam II

6) Calculate the molar ma A) 223.21 g/mol B) 247.52 g/mol C) 123.76 g/mol D) 119.52 g/mol E) 75.76 g/mol	ass for Mg(ClO4 <u>)</u>	2.			6)	
7) Which of the following A) 0.05 M CaCl <sub>2</sub> B) 0.10 M AlCl <sub>3</sub> C) 0.10 M LiCl D) 0.10 M MgCl <sub>2</sub> E) All of these solut		eve the highest concentration of chlo		ions?	7)	
8) Determine the name for A) tetraphosphorus (IV) B) phosphorus (IV) C) diphosphorus per D) phosphorus oxid E) phosphorus (II) oxid	decoxide oxide ntoxide e				8)	
9) How many H+ ions ca A) 0	n the acid, H2SO B) 1	4 , donate per molecule C) 2	?	D) 3	9)	
10) Determine the molarity 750.0 mL of solution. A) 0.130 M			g LiBr in enough	water to yield E) 1.50 M	10)	
11) According to the follow with 5.44 moles of H <sub>2</sub> G		action, how many mole	s of KO are requi	red to exactly react	11)	· · · · · · · · · · · · · · · · · · ·
4 KO(s) + 2 H <sub>2</sub> A) 2.72 moles H <sub>2</sub> B) 21.8 moles H <sub>2</sub> C) 5.44 moles H <sub>2</sub> D) 1.36 moles H <sub>2</sub> F) 10.9 moles H <sub>2</sub>	KO KO KO	(s) + O <sub>2</sub> (g)				

show work, you may lose points. Even on questions which do not require work, if you legibly show work, you may get some partial credit. (44 pts)
1. Complete the following naming question by either providing the name or providing the formula. (4pts, 2 pts each)
# prefix for 8 ammonium_
2. Balance the following reaction by filling in the blank with a number. The number may be the number one or any other number. The parts without a blank do not need any numbers input to balance the equation. (4 pts, 2 pts each)
$Na_2CO_3(aq) + 2 H NO_3(aq) \rightarrow $ NaNO <sub>3</sub> (aq) + H <sub>2</sub> CO <sub>3</sub> (aq)
3. For your reaction to work, if you need 2.77 moles of H NO <sub>3</sub> and you have a 0.555 M solution of the of HNO <sub>3</sub> in water, how many mL of the HNO <sub>3</sub> solution do you need? To answer this question complete the following expression by filling in the 4 parenthesis below with numbers. (8 pts, 2 pts each)
() mol H NO <sub>3</sub> * ml HNO <sub>3</sub> soln = () mL HNO <sub>3</sub> solution () mol HNO <sub>3</sub>
4. The following molecule is [(soluble) or (insoluble)] (circle one) in water. (4 pts)  LiOH
5. Complete the following precipitation reaction by filling in each blank with an ion or molecule. (7 1 pt each)
molecular equation
$Sr Cl_2 + Na_2 SO_4 \rightarrow \underline{\qquad} (aq) + Sr SO_4 (s)$
ionic equation
$Sr^{+2}(aq) + \underline{\qquad} (aq) + \underline{\qquad} (aq) + SO_4^{-2} \Rightarrow \underline{\qquad} (aq) + \underline{\qquad} (aq) + Sr SO_4 (s)$
Net ionic equation
$(aq) + (aq) \rightarrow Sr SO_4 (s)$
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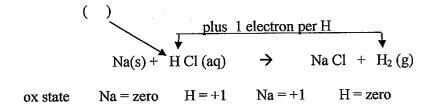
Part II Short Answer: Write the word or phrase or circle the choice that best completes each statement or answers the question. Some questions may require that you show work. If you do not

6. Circle the following which are weak acids. (5 pts)

HNO<sub>3</sub> H F H Cl CH<sub>3</sub>COOH

7. For the following redox reaction, fill in the parenthesis by the reagent with either the letter (a) or (b). (a) is being oxidized (b) is being reduced (4 pts)

H<sub>2</sub>SO<sub>4</sub>



8. What is the pressure of nitrogen if the total pressure of  $O_2$  (g) and  $N_2$  (g) is 1.1 atm and the pressure of  $O_2$  is 0.2 atm? (show work) (8 pts)

Part III. Long Answer Please show work for full credit and to receive partial credit. (33 pts)

\*\*\*\* Please attempt every problem for partial credit. You will get no partial credit if you just rewrite
the question with no change in anything.\*\*\*\*

1. a. Given the reaction below, what is the theoretical yield of KOH in grams if you start out with 24.8 grams of KO (FW of KOH = 56.11 g/mol FW of KO 55.10 g/mol) Assume excess amount of the other reactant. (show work) (15 pts)

 $4 \text{ KO (s)} + 2 \text{ H}_2\text{O (l)} \rightarrow 4 \text{ KOH (s)} + \text{O}_2 \text{ (g)}$ 

b. If the number of grams of the KOH based on the amount of  $H_2O$  is 30.5 grams, what is the limiting reagent? (Compare to Whove)

{ [KO] or [H<sub>2</sub>O]} (circle one) (3 pts)

2. If you have a gas at pressure 0.57 atm at a temperature of 285 K for a 2.0 mole sample of gas, what is the volume ? [PV = nRT, R=0.08206 (L atm)/(mol K)] (I made up these numbers so the numbers have no relation to reality.) (show work) (15 pts)