xam II General Chemistry I Lecture Spring 2014 3/10/15	Tuesday form 8:30 A Dr. Hahn Exam	# green
	Name	(sign)
ease show work for partial credit and full credit on the Lon ultiple choice questions have no partial credit. Please wr ork, I obviously cannot grade it. (2 pts print and sign exan uper but clearly label where the remaining answer can be fo	g Answers and in some of the Short Answer ite anything you want graded legibly. If I on If you run out of space, please continue bund. (If I can't find your answer, I obviously	cannot read your on the scratch
$_{A} = 6.022 \times 10^{23}$ $M_{1}V_{1} = M_{2}V_{2}$ (FW = formula mass of	or formula weight)	
art I MULTIPLE CHOICE. Choose the one alternative t	hat best completes the statement or answer	s the question.
o partial credit for MC. (2 pts per question, 26 pts total)	경찰, 된 보고 하면 다른 경험	,
1) Determine the name for aqueous HF.	원플랜드 전 경고 보온 사회	1) <u>J</u>
A) hydrofluorous acid	그들이 있는 하는데 그렇게 한다.	
B) hydrogen fluorate C) fluorous acid		
D) hydrofluoric acid		보기다 가는 왕
E) fluoric acid		
내 얼마하다 못하다는 끝하다에게 하는 것은		a R
2) Give the name for H ₂ CO ₃ .		2)1/
A) hydrocarbide acid Bycarbonic acid		
C) dihydrogen carbonate		
D) hydrocarbonic acid	4 1	
E) carbonous acid	2-6. 24-6, 6/6	
	12+6, 24+6, 6/6	21 C
12-24-0	H4O D) CH2O E) CHO2	3)
A) C110 (1) (2) (2)	2, 3, 2,	
4) Which of the following exists as a diatomic molecu	le?	4)
A) carbon		
B) phosphorus		
C) lithium D) krypton		
(E) flydrogen		
5) The solid compound, K2SO4, contains		5)
A) K_2 ⁺ and SO_4 ⁻² ions.	B) K2SO4 molecules.	
\bigcirc)K+ and SO ₄ $^{-2}$ ions.	D) K+, S $^{6+}$, and O $^{2-}$ ions.	
		1
6) What is the charge on the Sc ions in Sc ₂ O ₃ ?	C) 1	6)
(A) B+ B) 2+	C) 1+ D) 3-	
2(-1+(-2))	$\Rightarrow 20$	
2(50)	Ctro	
$2(5c)^{+}(-2)3$ $5c = +6$		
> = +6	/2 = t3	

7) Choose the statement below that is TRUE. A) A molecular compound that does not lonize in solution is considered a silving electrolyte. (3) A weak acid solution consists of mostly nonionized acid molecules. C) The term "strong electrolyte" means that the substance is extremely receive. C or duckly to 1) The term "weak electrolyte "means that the substance is ingd. Under the control of the		
A) A molecular compound that does not ionize in solution is considered a sixting electrolyte. (B) A weak acid solution consists of mostly monionized acid molecules. (C) The term "strong electrolyte" means that the substance is extremely relective. (D) The term "venk electrolyte" means that the substance is extremely relective. (E) A strong acid solution consists of only palselfy ionized acid molecules. (E) A strong acid solution consists of only palselfy ionized acid molecules. (E) A strong acid solution consists of only palselfy ionized acid molecules. (E) A phosphorus oxide (E) A phosphorus oxide (E) A phosphorus (I) oxide (E) Hersphosphorus pertoxide (E) Phosphorus (IV) oxide (E) Hersphosphorus decoxide (E) Phosphorus (IV) oxide (E) Lit and NO3- (E) There are no spectator ions in this reaction. (E) Give a possible molecular formula for C3H5CIO. (A) C6H10O2 (B) C5H10O2O2 (C) C6H10O2O2 (C) C6H10O3 (C) Lit and that holds the atoms together in a polyatomic ion. (E) the attraction between 2 nonmetal atoms. (E) the attraction between 2 metal atoms. (E) the attraction between 2 metal atoms. (E) the sharing of electrons. (E) the sharing of electrons. (E) Lit and Li		
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8) What is the name for \(\frac{1}{4} \) \(\lambda \) phosphorous pentoxide \(\lambda \) phosphorous pentoxide \(\lambda \) phosphorous (II) oxide \(\lambda \) phosphorous (IV) oxide \(\lamb		^
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B) C ₅ H ₁₀ Cl ₂ O ₂ C) C ₆ H ₁₀ Cl ₂ O ₂ D) C ₆ H ₁₀ Cl ₂ O ₂ E) C ₆ H ₁₂ Cl ₂ O ₂ 11) An ionic bond is best described as A) the attraction between 2 nonmetal atoms. B) the transfer of electrons from one atom to another. O) the attraction that holds the atoms together in a polyatomic ion. D) the attraction between 2 metal atoms. E) the sharing of electrons. 12) Determine the molecular formula of a compound that has a molar mass of 183.2 g/mol and an empirical formula of C ₂ H ₅ O ₂ (FW of C ₂ H ₅ O ₂ = 61.07 g/mol). A) C ₃ H ₇ O ₃ B) C ₂ H ₅ O ₂ O(C ₆ H ₁₅ O ₆ D) C ₈ H ₂ O ₈ E) C ₄ H ₁ O ₄ 13) Calculate the mass percent composition of sulfur in Al ₂ (SO ₄) ₃ . (FW aluminum sulfate = 342.21 13) g/mol, S atomic mass = 32.07 g/mol) A) 35.97 % B) 28.12 % C) 21.38 % D) 42.73 % E) 9.372 %	and and the first of the first	10)
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D) C6H10ClO2 E) C6H12ClO2 11) An ionic bond is best described as A) the attraction between 2 nonmetal atoms. B) the transfer of electrons from one atom to another. C) the attraction that holds the atoms together in a polyatomic ion. D) the attraction between 2 metal atoms. E) the sharing of electrons. 12) Determine the molecular formula of a compound that has a molar mass of 183.2 g/mol and an empirical formula of C2H5O2 (FW of C2H5O2 = 61.07 g/mol). A) C3H7O3 B) C2H5O2 C6H15O6 D) C8H20O8 E) C4H10O4 13) Calculate the mass percent composition of sulfur in Al2(SO4)3. (FW aluminum sulfate = 342.21 g/mol, S atomic mass = 32.07 g/mol) A) 35.97% B) 28.12% C) 21.38% D) 42.73% E) 9.372%		
E) C6H12Cl2O2 11) An ionic bond is best described as A) the attraction between 2 nonmetal atoms. B) the transfer of electrons from one atom to another. C) the attraction that holds the atoms together in a polyatomic ion. D) the attraction between 2 metal atoms. E) the sharing of electrons. 12) Determine the molecular formula of a compound that has a molar mass of 183.2 g/mol and an empirical formula of C2H5O2 (FW of C2H5O2 = 61.07 g/mol). A) C3H7O3 B) C2H5O2 C6H15O6 D) C8H2OO8 E) C4H10O4 13) Calculate the mass percent composition of sulfur in Al2(SO4)3. (FW aluminum sulfate = 342.21 13) g/mol, S atomic mass = 32.07 g/mol) A) 35.97 % B) 28.12 % C) 21.38 % D) 42.73 % E) 9.372 %		
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12) Determine the molecular formula of a compound that has a molar mass of 183.2 g/mol and an empirical formula of C ₂ H ₅ O ₂ (FW of C ₂ H ₅ O ₂ = 61.07 g/mol). A) C ₃ H ₇ O ₃ B) C ₂ H ₅ O ₂ (O)C ₆ H ₁₅ O ₆ D) C ₈ H ₂₀ O ₈ E) C ₄ H ₁₀ O ₄ 13) Calculate the mass percent composition of sulfur in Al ₂ (SO ₄) ₃ . (FW aluminum sulfate = 342.21 g/mol, S atomic mass = 32.07 g/mol) A) 35.97 % (B) 28.12 % C) 21.38 % D) 42.73 % E) 9.372 %	A) the attraction between 2 nonmetal atoms.	
12) Determine the molecular formula of a compound that has a molar mass of 183.2 g/mol and an empirical formula of C ₂ H ₅ O ₂ (FW of C ₂ H ₅ O ₂ = 61.07 g/mol). A) C ₃ H ₇ O ₃ B) C ₂ H ₅ O ₂ (O)C ₆ H ₁₅ O ₆ D) C ₈ H ₂₀ O ₈ E) C ₄ H ₁₀ O ₄ 13) Calculate the mass percent composition of sulfur in Al ₂ (SO ₄) ₃ . (FW aluminum sulfate = 342.21 g/mol, S atomic mass = 32.07 g/mol) A) 35.97 % (B) 28.12 % C) 21.38 % D) 42.73 % E) 9.372 %	(B) the transfer of electrons from one atom to another.	, <u> </u>
12) Determine the molecular formula of a compound that has a molar mass of 183.2 g/mol and an empirical formula of C ₂ H ₅ O ₂ (FW of C ₂ H ₅ O ₂ = 61.07 g/mol). A) C ₃ H ₇ O ₃ B) C ₂ H ₅ O ₂ (O)C ₆ H ₁₅ O ₆ D) C ₈ H ₂₀ O ₈ E) C ₄ H ₁₀ O ₄ 13) Calculate the mass percent composition of sulfur in Al ₂ (SO ₄) ₃ . (FW aluminum sulfate = 342.21 g/mol, S atomic mass = 32.07 g/mol) A) 35.97 % (B) 28.12 % C) 21.38 % D) 42.73 % E) 9.372 %	D) the attraction between 2 metal atoms.	
12) Determine the molecular formula of a compound that has a molar mass of 183.2 g/mol and an empirical formula of C ₂ H ₅ O ₂ (FW of C ₂ H ₅ O ₂ = 61.07 g/mol). A) C ₃ H ₇ O ₃ B) C ₂ H ₅ O ₂ (O)C ₆ H ₁₅ O ₆ D) C ₈ H ₂₀ O ₈ E) C ₄ H ₁₀ O ₄ 13) Calculate the mass percent composition of sulfur in Al ₂ (SO ₄) ₃ . (FW aluminum sulfate = 342.21 g/mol, S atomic mass = 32.07 g/mol) A) 35.97 % (B) 28.12 % C) 21.38 % D) 42.73 % E) 9.372 %	E) the sharing of electrons.	1231
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A) C ₃ H ₇ O ₃ B) C ₂ H ₅ O ₂ ©)C ₆ H ₁₅ O ₆ D) C ₈ H ₂₀ O ₈ E) C ₄ H ₁₀ O ₄ 13) Calculate the mass percent composition of sulfur in Al ₂ (SO ₄) ₃ . (FW aluminum sulfate = 342.21 13) $\frac{1}{1}$ g/mol, S atomic mass = 32.07 g/mol) A) 35.97 % (B) 28.12 % C) 21.38 % D) 42.73 % E) 9.372 % $\frac{1}{2}$ $\frac{1}{4}$ $$		12)
13) Calculate the mass percent composition of sulfur in Al ₂ (SO ₄) ₃ . (FW aluminum sulfate = 342.21 13) $\frac{B}{9}$ g/mol, S atomic mass = 32.07 g/mol) A) 35.97 % (B)/28.12 % C) 21.38 % D) 42.73 % E) 9.372 % $\frac{3(32.07)}{2,42,21}$ $\frac{3}{2}$ $$		7
g/mol, S atomic mass = 32.07 g/mol) A) 35.97 % B) 28.12 % C) 21.38 % D) 42.73 % E) 9.372 % $ \frac{2}{2}(32.07) $ $ \frac{2}{2}(42.21) $ $ \frac{2}{2}(32.07) $	A) C317/O3 b) C2175/O2 (C)/C61715/O6 D) C8172(1/O8 E) C4171(1)	J 4
g/mol, S atomic mass = 32.07 g/mol) A) 35.97 % B) 28.12 % C) 21.38 % D) 42.73 % E) 9.372 % $ \frac{2}{2}(32.07) $ $ \frac{2}{2}(42.21) $ $ \frac{2}{2}(32.07) $	13) Calculate the mass percent composition of sulfur in Ala(SOA)s. (FIM aluminum sulfate - 342.21	₁₃₎ B
A) 35.97 % (B)/28.12 % C) 21.38 % D) 42.73 % E) 9.372 %		10)
442,41		
442,41	(32.07)	
442,41	1-2 11 1 100 E) 8	
Dr. Hahn General Chemistry I Lecture Exam II Spring 2015 8:30 form A page 2	(442,41	74.4 (j.).3
	Dr. Hahn General Chemistry I Lecture Exam II Spring 2015 8:30 form A	page 2

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.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (39 pts)

1. Circle the following compounds which are ionic You may circle one, many, all or none. (10 pts, 2 pts each)

 N_2O_4





 CO_2

OF₂

2 What are 2 diatomic elements (elements which in the most stable state is a diatomic)? Name any 2 diatomic elements. (4 pts, 2 pts each)

12 02 M2 F2, C/2 Br2 I2

3 Write out the correct ionic formula for the following. Show work (4 pts total)

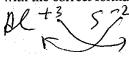
Between the elements:

Al and

 $\binom{N}{1}(+3) + \binom{S}{4}(-2) = 2ero$

Charge on Al is $\frac{+3}{2}$ Charge on S is $\frac{-7}{2}$ (1 pt charge) Explain your charges here.(1 pt explain)

Show work for coming up with the correct formula here (1 pt work, 1 pt correct formula)



General Chemistry I Lecture Exam II Spring 2015 (8:30 T,R form A) Dr. Hahn page 3 4 For the following formula, give the formula mass (or molar mass). Show work. (5 pts)

$$3(137.33) + 2(30.91) + 8(16.00) = 601.939$$
 411.99
 61.94

- 5. Balance the following reactions by: (6 pts)
- a. filling in the blanks. (you can fill the blank with a one but not a zero) (4 pts, 2 pt per blank)

$$_{2 \text{ H}_2 \text{S}} + \underline{1}_{\text{SO}_2} \rightarrow _{3 \text{S}} + \underline{2}_{\text{H}_2 \text{O}}$$

b. show the number count of every atom of each element separately for the reactant and products (2 pts, 1 pt per blank)

reactant atom count of S
$$\frac{3}{2}$$
 product atom count of S $\frac{3}{2}$

6 a. Given the following reactants, write out the products by filling in the blanks. You do not need to balance the reactions in either part of this question. (4 pt, 2 pts per blank)

$$K_2 CO_3(aq) + Ca Cl_2(aq) \rightarrow 2 C Cl (aq) + Ca CO_2 (s)$$

b. Complete the net ionic equation for the same reaction. (2 pts, 1 pt per blank)

$$\frac{\text{CO}_{\zeta}^{-1}(\text{aq}) + \text{Ca}^{+2}(\text{aq}) \rightarrow \text{CaCO}_{\zeta}}{\text{(s)}}$$

7 For the following reactions, circle the limiting reagent. (4 pts)

$$3 \text{ NO}_2 + \text{ H}_2\text{O} \rightarrow 2 \text{ HNO}_3 + \text{ NO}$$

Is the limiting reagent [$(3 \text{ moles of NO}_2)$ or $(3 \text{ moles of H}_2O)$] (circle one)?

<u>Part III.</u> 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.****

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.

1. Given the following reaction how many grams of $\underline{H_2S}$ [FW $\underline{H_2S} = 34.09$ g/mol] will you need if you want to make 2.77 grams of \underline{S} (FW $\underline{S} = 32.07$ g/mol)? Assume an excess of all other reagents for the reaction to proceed forward. (18 pts)

 2. If you want the molarity of a solution to be 0.25 M and you have a flask which holds exactly 100.0 mL, how many grams of H Cl will you need to make up the 100.0 mL of the solution? (FW HCl = 36.46 g/mol) (15 pts)

100.000 x 0.25 mol HU x 36.46gHQ 5g/n. 1000 ml 1 mg/ HU Soln. Well

0.919 HU

Exam	II General C	hemistry I l	Lecture Spring 2014	4 3/10/15 Tuesday	y form 8:30 B Dr. H	Iahn Exam#	
Name_		cly		_(print) Name _			(sign)
Multip work, paper	show work fo le choice ques I obviously c but clearly lab	r partial cre tions have r annot grade el where the	dit and full credit on no partial credit. I it. (2 pts print and	n the Long Answer Please write anythi sign exam) If you can be found. (If	rs and in some of the S ing you want graded lo r run out of space, plo I can't find your answe	Short Answer Ques egibly. If I canno ease continue on th	ot read your ne scratch
			Choose the one alte per question, 26 pt		completes the stateme	ent or answers the	question.
	1) The solid	compound,	K2SO4, contains				1)
		ind SO ₄ -2		B) K:	$_2$ + and SO $_4$ $^{-2}$ ions.		, ,
	$\overline{}$	O4 molecul			1 , S ⁶⁺ , and O ²⁻ ions.		
	C) X20	O4 Holecul	53.	<i>D</i>) X	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		A
	2) Determine	e the molect	ılar formula of a coı C2H5O2 (FW of C2	mpound that has a .H5O2 = 61.07 g/m	molar mass of 183.2 g	/mol and an	2)
	$\stackrel{\frown}{\text{A}}$ C ₆ H		B) C ₂ H ₅ O ₂			E) C ₈ H ₂₀ O ₈	
	3) Calculate	the mass pe	rcent composition o	of sulfur in Al2(SO2	į)3. (FW aluminum su	lfate = 342.21	3)
			s = 32.07 g/mol)				
	A) 42.73		B) 21.38 %	C) 9.372 %	D) 28.12 %	E) 35.97 %	
	1) Chassa th	a atatamant	below that is TRUE	ì			4)
			lution consists of or		d acid molecules.		-/
•			electrolyte" means				
					is extremely reactive.		
	∭A w	eak acid sol	ution consists of mo	stly nonionized ac	id molecules.		
	E) A m	olecular con	npound that does n	ot ionize in solutio	n is considered a stron	g electrolyte.	_
	5) An ionic b						٥)
		haring of el	tween 2 metal atom	15.			
			tween 2 nonmetal a	otoms.			
			at holds the atoms t		omic ion.		
			lectrons from one at				
	•						1
			g exists as a diatom	ic molecule?			6)
	(A) hyd					•	
		sphorus					
	C) lithi						
	D) kryp E) carb						
	E) Calb	OIL					

7) Determine the name for aqueous HF. A) hydrogen fluorate B) hydrofluorous acid C) hydrofluoric acid D) fluoric acid E) fluorous acid	7)
8) Identify the spectator ions in the following molecular equation.	8)
$LiCl(aq) + AgNO_3(aq) - AgCl(s) + LiNO_3(aq)$	
A) Ag ⁺ and Cl ⁻ B) Li ⁺ and Cl ⁻ C Li ⁺ and NO ₃ ⁻ D) Ag ⁺ and NO ₃ ⁻ E) There are no spectator ions in this reaction. 9) Give a possible molecular formula for C ₃ H ₅ ClO. A) C ₅ H ₁₀ Cl ₂ O ₂	9)
B) C ₆ H ₁₂ Cl ₂ O ₂	
C) C ₆ H ₁₀ O ₂ C ₆ H ₁₀ Cl ₂ O ₂	
E) C ₆ H ₁₀ ClO ₂	
10) What is the name for P4O10. A) phosphorus (IV) oxide B) diphosphorus pentoxide C) tetraphosphorus decoxide D) phosphorus (II) oxide E) phosphorus oxide	10)
11) Give the name for H2CO3.	11) <u>D</u>
A) hydrocarbonic acid B) dihydrogen carbonate C) hydrocarbide acid D carbonic acid E) carbonous acid	
12) What is the charge on the Sc ions in Sc ₂ O ₃ ?	12) <u>A</u>
(A) 3+ B) 2+ C) 3- D) 1+	
13) What is the empirical formula for C ₁₂ H ₂₄ O ₆ ? A) C ₂ H ₅ O B) CHO C) C ₂ H ₄ O D) CHO ₂ E) CH ₂ O	13) <u>C</u>

<u>Part II Short Answer</u>: 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.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (39 pts)

1. Circle the following compounds which are **covalent** You may circle one, many, all or none. (10 pts, 2 pts each)



What are 2 diatomic elements (elements which in the most stable state is a diatomic)? Name any 2 diatomic elements. (4 pts, 2 pts each)



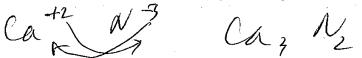
3 Write out the correct ionic formula for the following. Show work (4 pts total)

Between the elements: $(\#(Q)(+2) + (\#(N)(-3)) = 2e_{N}O(-3)$ Ca and N

Charge on Ca is $(\#(Q)(+2) + (\#(N)(-3)) = 2e_{N}O(-3)$ Charge on Ca is $(\#(Q)(+2) + (\#(N)(-3)) = 2e_{N}O(-3)$ Charge on Ca is $(\#(Q)(+2) + (\#(N)(-3)) = 2e_{N}O(-3)$ Charge on Ca is $(\#(Q)(+2) + (\#(N)(-3)) = 2e_{N}O(-3)$ Charge on Ca is $(\#(Q)(+2) + (\#(N)(-3)) = 2e_{N}O(-3)$ Charge on Ca is $(\#(Q)(+2) + (\#(N)(-3)) = 2e_{N}O(-3)$ Charge on Ca is $(\#(Q)(+2) + (\#(N)(-3)) = 2e_{N}O(-3)$ Charge on Ca is $(\#(Q)(+2) + (\#(N)(-3)) = 2e_{N}O(-3)$ Charge on Ca is $(\#(Q)(+2) + (\#(N)(-3)) = 2e_{N}O(-3)$

Charge on explain) Ca is +2 Charge on N is -3 (1 pt charge) Explain your charges here (1 pt -3) Charge on -3) Charge on -30 Charge

Show work for coming up with the correct formula here (1 pt work, 1 pt correct formula)



4 For the following formula, give the formula mass (or molar mass). Show work. (5 pts)

Al₂(SO₄)₃

$$12(804)^{3}$$
 $12(26,98) + 3(32,01) + (2(16,00) - 342,179)$
 $59,96$
 192
 192
 192
 192
 192
 192
 192
 192

- 5. Balance the following reactions by: (6 pts)
- a. filling in the blanks. (you can fill the blank with a one but not a zero) (4 pts, 2 pt per blank)

$$3NO_2 + 1 H_2O \rightarrow 2 HNO_3 + 1 NO$$

b. show the number count of every atom of each element separately for the reactant and products (2 pts, 1 pt per blank)

reactant atom count of

Dr. Hahn General Chemistry I Lecture Exam II Spring 2015 (8:30 T,R form B) page 4 6 a. Given the following reactants, write out the products by filling in the blanks. You do not need to balance the reactions in either part of this question. (4 pt, 2 pts per blank)

RbOH(aq) + Mg SO₄(aq)
$$\rightarrow$$
 Rb₂ 504 (aq) + Mg (O4), (s)

b. Complete the net ionic equation for the same reaction. (2 pts, 1 pt per blank)

$$Mg^{+2}(aq) + OR (aq) \rightarrow Mg^{OH}_{2}(s)$$

7 For the following reactions, circle the limiting reagent. (4 pts)

$$BCl_3 + 3 H_2O \rightarrow H_3BO_3 + 3 H Cl$$

Is the limiting reagent [(3 moles of BCl₃) or (3 moles of H₂O)] (circle one) ?

<u>Part III. Long Answer</u> Please <u>show work</u> 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.****

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.

1. Given the following reaction how many grams of C_8H_{18} [FW $C_8H_{18} = 114.26$ g/mol] will you need if you want to make 370.2 grams of H_2O (FW $H_2O = 18.02$ g/mol)? Assume an excess of all other reagents for the reaction to proceed forward. (18 pts)

 2. If you want the molarity of a solution to be 1.55 M and you have a flask which holds exactly 250.0 mL, how many grams of Na OH will you need to make up the 250.0 mL of the solution ? (FW Na OH = 40.00 g/mol) (15 pts)

250,000e x 1.55 nackaoy x 40.00g = 50h. 1000ml/604 x 40.00g = 50h. Soln.

15.50g Naly

Exam I	I General Chemistry I Lecture Spring 2014	3/10/15 Tuesday	form 9:55 A Dr. 1	Hahn Exam#_	Pink
Name	<u>Ceiz</u>	_(print) Name			(sign)
Multiple work, I paper bu	now work for partial credit and full credit or choice questions have no partial credit. If obviously cannot grade it. (2 pts print and set clearly label where the remaining answer 10.22×10^{23} $M_1V_1 = M_2V_2$ (FW = formulations)	Please write anythin sign exam) If you can be found. (If I	g you want graded run out of space, pl can't find your answ	legibly. If I cann lease continue on t	ot read your he scratch
11			•		
No parti	MULTIPLE CHOICE. Choose the one alteral credit for MC. (2 pts per question, 26 pt	s total) $(\mathcal{N}0)$	2) #27	92/46=2	- D
1	 Determine the molecular formula of a core empirical formula of NO2. (FW of NO2 = 	npound that has a r = 46.01 g/mol)		mol and an	1)
	A) NO ₂ B) N ₃ O ₆	C) N ₂ O ₅	D) N ₂ O ₄	E) N ₂ O ₃	
2	?) The solid compound, K2SO4, contains (A) K+ and SO4 $^{-2}$ ions.	B) K+,	S ⁶⁺ , and O ^{2–} ions.		2)
	C) K2SO4 molecules.	D) K ₂ +	and SO_4 -2 ions.		
3	B) phosphorus (II) bromide C) phosphorus (III) bromide D) potassium tribromide	ralent			3)
4	A) calcium (II) phosphite B) tricalcium phosphorustetraoxide	may			4)
	Calcium phosphate D) calcium (III) phosphite E) calcium phosphite				
5	i) Give the name for HNO3. A) nitrous acid B) hydrogen nitrite C) hydrogen nitrate (D) nitric acid E) hydrogen nitride				5)

					6 B
6) A covalent bond is be		•			0)
A) a bond between					
(B) the sharing of e		· ·			
C) a bond between		imetai.		•	
D) the transfer of e		one			
E) a bond between	t two poryatorine i	J115.			
7) Identify the spectator	ions in the follow	ing molecular equati	on.		7) 4
LiCl(aq)	+ AgNO3(aq) - A	gCl(s) + LiNO3(aq)			
(A)	• •				•
(A) Li+ and NO3-					
B) Ag+ and CI-			•		
C) Ag ⁺ and NO3 ⁻					
D) Li ⁺ and Cl ⁻					
E) There are no sp	ectator ions in this	reaction.			
	,				•
8) What is the empirical	formula for C12H	2406?	\mathbf{n}		8)
A) CH ₂ O	В) СНО	2406? + (G)C2H4O	D) CHO ₂	E) C ₂ H ₅ O	
11, 61720	<i>D</i> , C110	0, 2, 4			
9) Choose the statement	t below that is TRI	IE.			9) (
		ns that the substance	is extremely reacti	ve.	
B) A strong acid so	olution consists of	only partially ionized	l acid molecules.		
CDA weak acid so	lution consists of n	nostly nonionized aci	d molecules.		
D) A molecular co	mpound that does	not ionize in solution	n is considered a str	ong electrolyte.	
E) The term "weal	c electrolyte" mean	s that the substance i	is inert.		
10) Which of the followir	ng exists as a diato	nic molecule?			10)
A) krypton					
B) phosphorus		•			
C) carbon					
D) lithium					
(E) hydrogen					
					A
11) What is the charge or	- 1				11)
A) 1+	(B)/3+	C) 2+		D) 3-	
			COTAT CELLS 1	1 . 115.70	122 1
12) Calculate the mass pe			į. (FW of lithium pl	nosphate = 115.79	12)
g/mol , atomic mass			-, -, -, -, -, -, -, -, -, -, -, -, -, -	77.04.55.04	
A) 30.72 %	(B) 17.98 %	C) 55.27 %	D) 20.82 %	E) 26.75 %	
			F 2660	$\mathcal{I} \subset \mathcal{I}$	
13) What is the empirical	l formula fof Hg2(l	VO3)2?)	1 566,70	El Wi	
A) Hg2(NO3)2	(+2	- /	1	×100	2 /100
B) Hg(NO ₃) ₂			1 1151	19.	- 11,78
C) Hg4(NO3)4			· · · · · ·	. , —	
D) Hg2NO3					
(E)HgNO ₃			,		
27.5.03					
					•

Dr. Hahn General Chemistry I Lecture Exam II Spring 2015

page 2

9:55 form A

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.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (39 pts)

1. Circle the following compounds which are ionic You may circle one, many, all or none. (10 pts, 2 pts each)

PBr₃

CCI₄

BaCl2

SiO₂

Rb₃N

2. Give the name or the formula and charge (for the polyatomic ions) or number for the following. (4 pts, 2 pts each)

H2 SO4 Sulfuric acid

Write out the correct ionic formula for the following. Show work (4 pts total)

Between the elements:

Ga and

Charge on Ga pt explain)

Charge on Br is ____ (1 pt charge) Explain your charges here.(1)

Noty H = 5 7 - S = -1

Show work for coming up with the correct formula here (1 pt work, 1 pt correct formula)

ba, Br, - baby

page 3

Dr. Hahn General Chemistry I Lecture Exam II Spring 2015 (9:55 T,R form A) 3 If you have the following ionic compound, is the reagent soluble or insoluble in water. Circle the correct choices below to answer this question. (5 pts)

Sr SO₄

The anion is [(soluble)] or (insoluble)] (circle one) (2.5 pt)

The ionic compound is [(soluble) or (insoluble)] (circle one) (2.5 pt)

- 5. Balance the following reactions by: (6 pts)
- a. filling in the blanks. (you can fill the blank with a one but not a zero) (4 pts, 2 pt per blank)

 $Al_2S_3 + 6 H_2O \rightarrow 2 Al(OH)_3 + 3 H_2S$

b. show the number count of every atom of each element separately for the reactant and products (2 pts, 1 pt per blank)

reactant atom count of AI $\frac{2}{45}$ AI $\frac{2}{45}$ $\frac{4}{5}$ $\frac{4}{5}$

Dr. Hahn General Chemistry I Lecture Exam II Spring 2015 (9:55 T,R form A) page 4

6 a. Given the following reactants, write out the products by filling in the blanks. You do not need to balance the reactions in either part of this question. (4 pt, 2 pts per blank)

Ba S + Na₃ PO₄
$$\rightarrow$$
 \bigcirc (aq) + \bigcirc \bigcirc (\bigcirc (S)

b. Complete the following complete ionic equation for the same reaction (2 pts, 1 pt per blank)

$$Ba^{+2}(aq) + S^{-2}(aq) + 3 Na^{+1}(aq) + 10 (aq) + 3 Na^{+1}(aq) + 3 Na^{+$$

7 For the following reactions, circle the limiting reagent. (4 pts)

$$C_3H_7SH + 6 O_2 \rightarrow 3 CO_2 + SO_2 + 4 H_2O$$

Is the limiting reagent [(6 moles of C₃H₇SH) or (6 moles of O₂)] (circle one) ?

<u>Part III. Long Answer</u> Please <u>show work</u> 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.****

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.

1. How many atoms of H in the molecule (NH₄)₂O is in 235.2 grams of the (NH₄)₂O [FW of (NH₄)₂O = 52.10 g/mol]? (18 pts)

1 moleune (NH4)20 has $4*2=8 \pm atoms$ $1 mol(NH4)20 \approx 8 molt$ $235.2g \times \frac{mol(NH4)20}{52.10g} \times \frac{8 molt}{1 mol}$ (NH4)20 (NH4)20 (NH4)20 $\times \frac{6.022 \times 10^{23} atoms}{1 mol} = 2.175 \times 10^{25}$ 1 molt atoms H 2. If you have 85.2 mL of a solution of concentration 1.5 M and want the new molarity to be 0.75 M, how many mL will the new diluted solution have to be ? $(M_1V_1 = M_2V_2)$ (15 pts)

 $V_{12} = 85.2$ $M_{12} = 1.5 \text{ m}$ $M_{12} = 0.75 \text{ m}$ $(1.5 \text{ m}) (85.2 \text{ ml}) = (0.75 \text{ m}) (V_{2} \text{ nl})$

ame		(print) Name _			(sign)
ease show work for partia ultiple choice questions hat ork, I obviously cannot g per but clearly label when $A = 6.022 \times 10^{23}$ M_1V_1	nve no partial credit. rade it. (2 pts print an e the remaining answ	Please write anyth id sign exam) If yo er can be found. (If	ing you want graded u run out of space, j I can't find your ans	l legibly. If I can please continue on	not read you the scratch
rt I MULTIPLE CHOIC	E. Choose the one a	Iternative that best	completes the states	nent or answers th	e question.
o partial credit for MC. (2				•	1
Identify the spect	ator ions in the follow	ing molecular equat	ion.		1) 1
LiCl(aq) + AgNO3(aq) - A	.gCl(s) + LiNO3(aq)			
A) Ag ⁺ and Cl ⁻ B Li ⁺ and NC C) Li ⁺ and Cl ⁻ D) Ag ⁺ and NC	D3-				
·	o spectator ions in this				·
	s percent composition nass of Li = 6.94 g/mol B) 20.82 %)4. (FW of lithium ph D) 30.72 %	eosphate = 115.79 E) 26.75 %	2) <u>~</u>
3) Give the name for	r HNO3.				3)
A) hydrogen n B) hydrogen n C) hydrogen n D) nitrous acid E) nitric acid	itride itrite itrate				
	olecular formula of a control of NO ₂ . (FW of NO ₂		molar mass of 92.0 g	,	4)
A) NO ₂	B) N ₃ O ₆	C) N ₂ O ₅	D) N ₂ O ₃	E) N ₂ O ₄	
5) Which of the follo A) krypton	wing exists as a diator	mic molecule?			5)
B) carbon C) lithium D) hydrogen E) phosphorus					
6) What is the amois	ical formula for C ₁₂ H	D4O≥?			6)

7) Give the name for PBr3. A) phosphorus (III) bromide B) potassium tribromide C) phosphorus bromide D) phosphorus tribromide E) phosphorus (II) bromide		7)
8) Write the name for Ca3(PO4)2. A) calcium (III) phosphite C) calcium phosphate C) calcium (II) phosphite D) tricalcium phosphorustetraoxide E) calcium phosphite	p, i On i C	8)
9) Choose the statement below that is TRUE. A) A strong acid solution consists of only partially B) A weak acid solution consists of mostly nonion C) The term "weak electrolyte" means that the su D) The term "strong electrolyte" means that the su E) A molecular compound that does not ionize in	nized acid molecules. bstance is inert. ubstance is extremely reactive.	9)
10) The solid compound, K2SO4, contains		10)
(A) K+ and SO ₄ -2 ions.	B) K_2^+ and SO_4^{-2} ions.	
C) K2SO4 molecules.	D) K+, S^{6+} , and O^{2-} ions.	
 11) A covalent bond is best described as A) a bond between a metal and a polyatomic ion. B) the sharing of electrons between atoms. C) a bond between a metal and a nonmetal. D) the transfer of electrons. E) a bond between two polyatomic ions. 		11)
12) What is the empirical formula for Hg2(NO3)2?		12)
A) Hg4(NO ₃) ₄		
B) Hg2(NO ₃) ₂ C) Hg2NO ₃ D) Hg(NO ₃) ₂ E) HgNO ₃		
13) What is the charge on the Sc ions in Sc ₂ O ₃ ? A) 1+ B) 2+	(C)/3+ D) 3-	13)

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.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (39 pts)

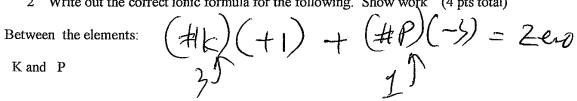
1.	Circle the following compounds which are covalent	You may circle one, many, all or none.	(10
	pts, 2 pts each)		



Give the name or the formula and charge (for the polyatomic ions) or number for the following. (4 pts, 2 pts each)

3	(as number prefix)	phosphate	POC	-3	
	·				

2 Write out the correct ionic formula for the following. Show work (4 pts total)



Show work for coming up with the correct formula here (1 pt work, 1 pt correct formula)



Dr. Hahn General Chemistry I Lecture Exam II Spring 2015 (9:55 T,R form B) page 3 3 If you have the following ionic compound, is the reagent soluble or insoluble in water. Circle the correct choices below to answer this question. (5 pts)

NH₄OH

The anion is [(soluble) of (insoluble) (circle one) (2.5 pt)

The ionic compound is [(soluble) or (insoluble)] (circle one) (2.5 pt) WHYT IS exception

- 5. Balance the following reactions by: (6 pts)
- a. filling in the blanks. (you can fill the blank with a one but not a zero) (4 pts, 2 pt per blank)

$$N_{2}O_{4} + \frac{2}{4N_{2}H_{4}} \rightarrow 3N_{2} + \frac{4}{4H_{2}O}$$

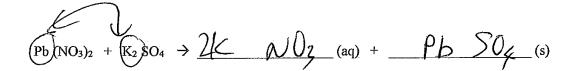
$$\frac{4N}{4} + \frac{2}{4N_{2}H_{4}} \rightarrow 3N_{2} + \frac{4}{4H_{2}O}$$

b. show the number count of every atom of each element separately for the reactant and products (2 pts, 1 pt per blank)

reactant atom count of $C_N = C_N =$

Dr. Hahn General Chemistry I Lecture Exam II Spring 2015 (9:55 T,R form B) page 4

6 a. Given the following reactants, write out the products by filling in the blanks. You do not need to balance the reactions in either part of this question. (4 pt, 2 pts per blank)



b. Complete the following complete ionic equation for the same reaction (1 pt) (2 pts, 1 pt per blank)

$$Pb^{+2}(aq) + 2 NO_3^{-1}(aq) + 2 K^{+1}(aq) + SO_4^{-2}(aq) \rightarrow 2 k^{-1}(aq) + 2 NO_3^{-1} Pb SO_4^{-1}(s)$$

7 For the following reactions, circle the limiting reagent. (4 pts)

$$2 \text{ HCl} + \text{ Fe } \rightarrow \text{ H}_2 + \text{ Fe Cl}_2$$

Is the limiting reagent [2 moles of HCl] or (2 moles of Fe)] (circle one) ?

<u>Part III. Long Answer</u> Please <u>show work</u> 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.****

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.

1. How many atoms of O in the molecule $Al_2(SO_4)_3$ is in 789.2 grams of the $Al_2(SO_4)_3$ [FW of $Al_2(SO_4)_3 = 342.17$ g/mol]? (18 pts)

1 hol N2(504), has 3+4= (20)

189,29 × 1mol Ale (504)3 × 12 mol De (504)3 × 12 mol De (504)3 × 12 mol De (504)3 × 12 (504)3

 $\times \frac{6.022 \times 10^{25} \text{ atoms 0}}{1 \text{ nal 0}} = 1,667 \times 10^{25} \text{ atoms 0}$

2 If you have 25.4 mL of a solution of concentration 0.25 M and want the new molarity to be 0.10 M, how many mL will the new diluted solution have to be? $(M_1V_1 = M_2V_2)$ (15 pts)

V12 25.62

M, =0.25m

V2=?

M2 = 0.10 m

(0,25m) (25,4ml) = (0,10m) (12m)

 $V_2 ml = \frac{(0.25 m)(25.6 ml)}{(0.10 m)}$

V2 = 69,5 ml

e		(print) Name			(sign)
se show work for partially iple choice questions had been a considered and the second of the second	ave no partial credit. trade it. (2 pts print an re the remaining answ	Please write anyth d sign exam) If yo er can be found. (If	ning you want grade ou run out of space , I can't find your an	d legibly. If I can please continue of	nnot read your n the scratch
I MULTIPLE CHOIC artial credit for MC. (completes the state	ment or answers t	he question.
1) Determine the na	ame for aqueous HF.				1)
A) hydrofluor	ous acid				
B) hydrogen f			•		
C) fluorous ac					
D) hydrofluori E) fluoric acid		5			
2) Give the name fo	or H2CO3.				2)
A) hydrocarbi	de acid				
B) carbonic ac					
C) dihydroger					
D) hydrocarbo					
E) carbonous	acid				
3) What is the empi	rical formula for C ₁₂ H	12406?			3)
A) CHO	B) C ₂ H ₅ O	C) C ₂ H ₄ O	D) CH ₂ O	E) CHO ₂	
	owing exists as a diato	mic molecule?			4)
A) carbon	_				
B) phosphorus C) lithium	;				
D) krypton					
E) hydrogen					
5) The solid compo	and, K2SO4, contains				5)
A) K ₂ + and SC		B) K	2SO4 molecules.		,
C) K+ and SO	_		+, S^{6+} , and O^{2-} ions	i .	
6) What is the charg	ge on the Sc ions in Sc2	O2?			6)
A) 3+	B) 2+	⊙3. C) 1₁	<u> </u>	D) 3-	~/
,	۵, ۵.	C) 11		~, ·	

7) Choose the statement below that is TRUE.				7)
A) A molecular compound that does not ion			electrolyte.	
B) A weak acid solution consists of mostly in				
C) The term "strong electrolyte" means that D) The term "weak electrolyte" means that				
E) A strong acid solution consists of only pa				
Ly 11 strong acter solution consists of only pe	irdany iorazou me			
8) What is the name for P4O10.				8)
A) phosphorus oxide				
B) diphosphorus pentoxide				
C) phosphorus (II) oxide				
D) tetraphosphorus decoxide				
E) phosphorus (IV) oxide				
9) Identify the spectator ions in the following mo	lecular equation.			9)
LiCl(aq) + AgNO3(aq) - AgCl(s)	+ LiNO3(aq)			
A) Ag ⁺ and NO3 ⁻				
B) Li ⁺ and Cl ⁻				
C) Li+ and NO ₃ -				
D) Ag ⁺ and Cl ⁻				
E) There are no spectator ions in this reaction	on.			
10) Give a possible molecular formula for C3H5Cl	IO.			10)
A) $C_6H_{10}O_2$				
B) C ₅ H ₁₀ Cl ₂ O ₂				
C) C ₆ H ₁₀ Cl ₂ O ₂				
D) C ₆ H ₁₀ ClO ₂				
E) C ₆ H ₁₂ Cl ₂ O ₂				
11) An ionic bond is best described as				11)
A) the attraction between 2 nonmetal atoms	s.			11)
B) the transfer of electrons from one atom to				
C) the attraction that holds the atoms togeth		ic ion.		
D) the attraction between 2 metal atoms.	^ -			
E) the sharing of electrons.				
12) Determine the molecular formula of a compou	and that has a mo	lar mass of 183.2 g/m	ol and an	12)
empirical formula of C2H5O2 (FW of C2H5O				,
A) C ₃ H ₇ O ₃ B) C ₂ H ₅ O ₂ C)	C ₆ H ₁₅ O ₆	D) C ₈ H ₂₀ O ₈	E) C ₄ H ₁₀ O ₄	
13) Calculate the mass percent composition of sulf	fur in Al2(SO4)3.	(FW aluminum sulfa	te = 342.21	13)
g/mol, S atomic mass = 32.07 g/mol)				
A) 35.97 % B) 28.12 % C)	21.38 %	D) 42.73 %	E) 9.372 %	

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.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want

me to grad	e it, clearly indi			ur work. (39	pts)	on pupor	
	cle the following each)	compounds wh	nich are <u>io</u>	nic You may ci	rcle one, many, all or	none.	(10 pts, 2
N ₂ O ₄	Li ₃ P	NaNO ₃	CO_2	OF ₂			
	at are 2 diatomic omic elements.	elements (elem (4 pts, 2 pts e		h in the most sta	ble state is a diatomi	c)? Nam	e any 2
3 Write Between the Al and		ionic formula	for the foll	owing. Show w	ork (4 pts total)		
Charge on A explain)	Al is(Charge on S	is	(1 pt charge)	Explain your charge	es here.(1	pt
Show work	for coming up w	ith the correct t	formula he	re (1 pt work, 1	pt correct formula)		
Dr. Hahn	General Chemis	try I Lecture	Exam II	Spring 2015	(8:30 T,R form A)	page	3

4 For the following formula, give the formula mass (or molar mass). Show work. (5 pts) $Ba_3 (PO_4)_2$

- 5. Balance the following reactions by: (6 pts)
- a. filling in the blanks. (you can fill the blank with a one but not a zero) (4 pts, 2 pt per blank)

 $2 H_2 S +$ $SO_2 \rightarrow 3 S +$ $H_2 O$

b. show the number count of every atom of each element separately for the reactant and products (2 pts, 1 pt per blank)

reactant atom count of S ______ product atom count of S _____

Dr. Hahn General Chemistry I Lecture Exam II Spring 2015 (8:30 T,R form A) page 4

6 a. Given the following reactants, write out the products by filling in the blanks. You do not need to balance the reactions in either part of this question. (4 pt, 2 pts per blank)

$$K_2 CO_3(aq) + Ca Cl_2(aq) \rightarrow$$
 (aq) + (s)

b. Complete the net ionic equation for the same reaction. (2 pts, 1 pt per blank)

$$\underline{\qquad} (aq) + Ca^{+2} (aq) \rightarrow \underline{\qquad} (s)$$

7 For the following reactions, circle the limiting reagent. (4 pts)

$$3 \text{ NO}_2 + \text{H}_2\text{O} \rightarrow 2 \text{HNO}_3 + \text{NO}$$

Is the limiting reagent [(3 moles of NO₂) or (3 moles of H₂O)] (circle one)?

<u>Part III. Long Answer</u> Please <u>show work</u> 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.****

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.

1. Given the following reaction how many grams of H_2S [FW $H_2S = 34.09$ g/mol] will you need if you want to make 2.77 grams of S (FW S = 32.07 g/mol)? Assume an excess of all other reagents for the reaction to proceed forward. (18 pts)

 $2H_2S + SO_2 \rightarrow 3S + 2H_2O$

2. If you want the molarity of a solution to be 0.25 M and you have a flask which holds exactly 100.0 mL, how many grams of H Cl will you need to make up the 100.0 mL of the solution? (FW HCl = 36.46 g/mol) (15 pts)

Exam II General Chemistry I	Lecture Spring 201	4 3/10/15 Tuesday	form 8:30 B Dr. H	ahn Exam#	<u>1~4</u>						
Name(print) Name											
Please show work for partial credit and full credit on the Long Answers and in some of the Short Answer Questions. Multiple choice questions have no partial credit. Please write anything you want graded legibly. If I cannot read your work, I obviously cannot grade it. (2 pts print and sign exam) If you run out of space, please continue on the scratch paper but clearly label where the remaining answer can be found. (If I can't find your answer, I obviously cannot grade it). $N_A = 6.022 \times 10^{23} \qquad M_1 V_1 = M_2 V_2 (FW = \text{formula mass or formula weight)}$											
Part I MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. No partial credit for MC. (2 pts per question, 26 pts total)											
1) The solid compound	, K2SO4, contains				1)						
A) K+ and SO ₄ -2	B) K ₂										
C) K2SO4 molecu		D) K+									
2) Determine the molecular formula of a compound that has a molar mass of 183.2 g/mol and an empirical formula of $C_2H_5O_2$ (FW of $C_2H_5O_2=61.07$ g/mol).											
A) C ₆ H ₁₅ O ₆	B) C ₂ H ₅ O ₂	C) C ₃ H ₇ O ₃	D) C ₄ H ₁₀ O ₄	E) C ₈ H ₂₀ O ₈							
3) Calculate the mass percent composition of sulfur in Al ₂ (SO ₄) ₃ . (FW aluminum sulfate = 342.21 g/mol, S atomic mass = 32.07 g/mol)											
A) 42.73 %		C) 9.372 %	D) 28.12 %	E) 35.97 %							
 4) Choose the statement below that is TRUE. A) A strong acid solution consists of only partially ionized acid molecules. B) The term "weak electrolyte" means that the substance is inert. C) The term "strong electrolyte" means that the substance is extremely reactive. D) A weak acid solution consists of mostly nonionized acid molecules. E) A molecular compound that does not ionize in solution is considered a strong electrolyte. 											
5) An ionic bond is bes	t described as				5)						
 A) the attraction between 2 metal atoms. B) the sharing of electrons. C) the attraction between 2 nonmetal atoms. D) the attraction that holds the atoms together in a polyatomic ion. E) the transfer of electrons from one atom to another. 											
6) Which of the followi A) hydrogen B) phosphorus C) lithium D) krypton E) carbon	ng exists as a diator	nic molecule?			6)						

7) Determine the name for aqueous A) hydrogen fluorate B) hydrofluorous acid C) hydrofluoric acid D) fluoric acid E) fluorous acid	HF.					7)
8) Identify the spectator ions in the	ollowing molecula	r equation.		-		8)
LiCl(aq) + AgNO3(a	q) - AgCl(s) + LiNe	O3(aq)				
A) Ag ⁺ and Cl ⁻ B) Li ⁺ and Cl ⁻ C) Li ⁺ and NO3 ⁻ D) Ag ⁺ and NO3 ⁻ E) There are no spectator ions	in this reaction.					
-						0)
9) Give a possible molecular formul A) C5H ₁₀ Cl ₂ O ₂ B) C ₆ H ₁₂ Cl ₂ O ₂ C) C ₆ H ₁₀ O ₂	a for C3H5CIO.					9)
D) C ₆ H ₁₀ Cl ₂ O ₂ E) C ₆ H ₁₀ ClO ₂						
10) What is the name for P4O ₁₀ . A) phosphorus (IV) oxide B) diphosphorus pentoxide C) tetraphosphorus decoxide D) phosphorus (II) oxide						10)
E) phosphorus oxide 11) Give the name for H2CO3. A) hydrocarbonic acid B) dihydrogen carbonate C) hydrocarbide acid D) carbonic acid E) carbonous acid	·					11)
12) What is the charge on the Sc ions A) 3+ B) 2-		C) 3-		D) 1+		12)
13) What is the empirical formula for A) C ₂ H ₅ O B) CHO	С ₁₂ H ₂₄ O ₆ ? С) С ₂ H	4O	D) CHO ₂	E) CI	H ₂ O	13)

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.

nt

Please me to	show all wo grade it, clea	rk on th arly indi	is exam itself cate where I	f. If you are	e going to show or work. (39	w work on the sci pts)	ratch paper at	id wai
1.	Circle the for pts, 2 pts each	_	compounds w	hich are <u>cov</u>	ralent You may	circle one, many	, all or none.	(10
N ₂ O ₄	Li ₃ P		NaNO ₃	CO_2	OF ₂			
2	What are 2 diatomic ele		elements (ele (4 pts, 2 pts		in the most sta	able state is a diato	omic)? Name a	ıny 2
3 Betwee	en the eleme		ionic formula	a for the folk	owing. Show v	vork (4 pts total))	
	on Ca is		Charge on	N is	(1 pt charg	ge) Explain your o	charges here.(1	pt
Show [,]	work for com	iing up w	rith the correc	t formula he	re (1 pt work, 1	pt correct formul	a)	

4	For the following formula,	give the formula mass	(or molar mass).	Show work.	(5 pts)
---	----------------------------	-----------------------	------------------	------------	---------

Al₂(SO₄)₃

- 5. Balance the following reactions by: (6 pts)
- a. filling in the blanks. (you can fill the blank with a one but not a zero) (4 pts, 2 pt per blank)

$$2$$
NO₂ + _____ NO \rightarrow 2 HNO₃ + _____ NO

b. show the number count of every atom of each element separately for the reactant and products (2 pts, 1 pt per blank)

reactant atom count of H_______H

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6 a. Given the following reactants, write out the products by filling in the blanks. You do not need to balance the reactions in either part of this question. (4 pt, 2 pts per blank)

$RbOH(aq) + Mg SO_4(aq) \rightarrow$	(ag)	+ (S
MODINALLY THE BOHLARY	(04)		,-,

b. Complete the net ionic equation for the same reaction. (2 pts, 1 pt per blank)

$$Mg^{+2}(aq) + \underline{\qquad} (aq) \rightarrow \underline{\qquad} (s)$$

7 For the following reactions, circle the limiting reagent. (4 pts)

$$BCl_3 + 3 H_2O \rightarrow H_3BO_3 + 3 H Cl$$

Is the limiting reagent [(3 moles of BCl₃) or (3 moles of H₂O)] (circle one) ?

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<u>Part III. Long Answer</u> Please <u>show work</u> 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.****

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.

1. Given the following reaction how many grams of C_8H_{18} [FW $C_8H_{18} = 114.26$ g/mol] will you need if you want to make 370.2 grams of H_2O (FW $H_2O = 18.02$ g/mol)? Assume an excess of all other reagents for the reaction to proceed forward. (18 pts)

 $2 C_8 H_{18} + 25 O_2 \rightarrow 16 CO_2 + 18 H_2 O$

2. If you want the molarity of a solution to be $1.55\,\mathrm{M}$ and you have a flask which holds exactly $250.0\,\mathrm{mL}$, how many grams of Na OH will you need to make up the $250.0\,\mathrm{mL}$ of the solution ? (FW Na OH = $40.00\,\mathrm{g/mol}$) (15 pts)

Multiple of work, I of paper but NA = 6.02 Part I M No partia	ow work for partial creachoice questions have nobviously cannot grade t clearly label where the 22×10^{23} $M_1V_1 = M_2$ MULTIPLE CHOICE. Cal credit for MC. (2 pts.)	to partial credit. it. (2 pts print and e remaining answer 2V2 (FW = formulation)	Please write anything sign exam) If you rean be found. (If all a mass or formula ternative that best of the state of the s	ing you want grade u run out of space , I can't find your ans a weight)	d legibly. If I can please continue on swer, I obviously ca	not read your the scratch
No partia 1)	al credit for MC. (2 pts) Determine the molecu			compieies me state	ment or answers th	ıe question.
) Determine the molecu	1 (1 (1)
2)	empiricai formula of f	NO ₂ . (FW of NO ₂	mpound that has a = 46.01 g/mol)	i iliolai iliass oi 92.0	g/mor and an	*)
2)	A) NO ₂	B) N ₃ O ₆	C) N ₂ O ₅	D) N ₂ O ₄	E) N ₂ O ₃	
2)						
) The solid compound,	K2SO4, contains				2)
	A) K+ and SO 4^{-2} i	ions.	B) K	+, S^{6+} , and O^{2-} ions	5.	
	C) K2SO4 molecule	es.	D) K ₂	2^+ and SO 4^{-2} ions.		
3)) Give the name for PBi					3)
	A) phosphorus (II) B) phosphorus bro					
	C) phosphorus (III)					
	D) potassium tribro					
	E) phosphorus trib					
4)) Write the name for Ca					4)
	A) calcium (II) pho B) tricalcium phosp					
	C) calcium phospha					
	D) calcium (III) pho					
	E) calcium phosphi	ite				
						 \
5)) Give the name for HN	1O3.				5)
	A) nitrous acid					
	B) hydrogen nitrite					
	C) hydrogen nitrateD) nitric acid	e				
	E) hydrogen nitrid	e				

6) A covalent bond is b	est described as				6)
•	en a metal and a pol	lyatomic ion			·/
	electrons between a				
	en a metal and a no				
D) the transfer of		,			
	n two polyatomic i	ons			
L) a bona betwee	at two poryutomic r	0110.			
7) Identify the spectato	or ions in the follow	ing molecular equati	on.		7)
LiCl(aq) + AgNO3(aq) - A	gCl(s) + LiNO3(aq)			
A) Li+ and NO3-					
B) Ag ⁺ and Cl ⁻					
C) Ag+ and NO3	-	•			
D) Li ⁺ and Cl ⁻	8				
•	pectator ions in this	reaction.			
8) What is the empirica	ol formula for C12H	2406?			8)
A) CH ₂ O	B) CHO	C) C ₂ H ₄ O	D) CHO ₂	E) C ₂ H ₅ O	. 0,
A) CIZO	b) CHO	C) C21140	b) C102	L) C21150	*
0) Chassa tha at-ta-	et le al acceptable de TDT	TE:			9)
Choose the statemer The term "etro		ns that the substance	ic avtramaly razetis	70	9)
B) A strong acid s				/C.	
			i acid molecines		
C) A weak acid so	olution consists of m	nostly nonionized ac	id molecules.	ong electrolyte.	
C) A weak acid so D) A molecular co	olution consists of mompound that does	nostly nonionized aci not ionize in solution	id molecules. n is considered a stro	ong electrolyte.	
C) A weak acid so D) A molecular co	olution consists of mompound that does	nostly nonionized ac	id molecules. n is considered a stro	ong electrolyte.	
C) A weak acid so D) A molecular co E) The term "wea	olution consists of mompound that does k electrolyte" mean	nostly nonionized aci not ionize in solution is that the substance	id molecules. n is considered a stro	ong electrolyte.	10)
C) A weak acid so D) A molecular co E) The term "wea 10) Which of the followi	olution consists of mompound that does k electrolyte" mean	nostly nonionized aci not ionize in solution is that the substance	id molecules. n is considered a stro	ong electrolyte.	10)
C) A weak acid so D) A molecular co E) The term "wea 10) Which of the followi A) krypton	olution consists of mompound that does k electrolyte" mean	nostly nonionized aci not ionize in solution is that the substance	id molecules. n is considered a stro	ong electrolyte.	10)
C) A weak acid so D) A molecular co E) The term "wea 10) Which of the followi	olution consists of mompound that does k electrolyte" mean	nostly nonionized aci not ionize in solution is that the substance	id molecules. n is considered a stro	ong electrolyte.	10)
C) A weak acid so D) A molecular co E) The term "wea 10) Which of the followi A) krypton B) phosphorus	olution consists of mompound that does k electrolyte" mean	nostly nonionized aci not ionize in solution is that the substance	id molecules. n is considered a stro	ong electrolyte.	10)
C) A weak acid so D) A molecular co E) The term "wea 10) Which of the followi A) krypton B) phosphorus C) carbon	olution consists of mompound that does k electrolyte" mean	nostly nonionized aci not ionize in solution is that the substance	id molecules. n is considered a stro	ong electrolyte.	10)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the followith A) krypton B) phosphorus C) carbon D) lithium	olution consists of mompound that does k electrolyte" mean	nostly nonionized aci not ionize in solution is that the substance	id molecules. n is considered a stro	ong electrolyte.	10)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the followith A) krypton B) phosphorus C) carbon D) lithium	olution consists of mompound that does k electrolyte" mean mg exists as a diator	nostly nonionized aci not ionize in solution is that the substance mic molecule?	id molecules. n is considered a stro	ong electrolyte.	10)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the followith A) krypton B) phosphorus C) carbon D) lithium E) hydrogen	olution consists of mompound that does k electrolyte" mean mg exists as a diator	nostly nonionized aci not ionize in solution is that the substance mic molecule?	id molecules. n is considered a stro is inert.	ong electrolyte. D) 3-	
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the followin A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+	olution consists of mompound that does k electrolyte" meaning exists as a diator the Sc ions in Sc26	nostly nonionized aci not ionize in solution is that the substance of mic molecule? O3? C) 2+	id molecules. n is considered a stro is inert.	D) 3-	11)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the followith A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+	olution consists of mompound that does k electrolyte" meaning exists as a diator the Sc ions in Sc2(B) 3+	nostly nonionized aci not ionize in solution is that the substance mic molecule? O3? C) 2+ of lithium in Li3PO4	id molecules. n is considered a stro is inert.	D) 3-	
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the followith A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+ 12) Calculate the mass prog/mol , atomic mass	olution consists of mompound that does k electrolyte" meaning exists as a diator the Sc ions in Sc2(B) 3+ ercent composition is of Li = 6.94 g/mol	nostly nonionized aci not ionize in solution is that the substance mic molecule? O3? C) 2+ of lithium in Li3PO4	id molecules. In is considered a stro Is inert. In (FW of lithium ph	D) 3- osphate = 115.79	11)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the followith A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+	olution consists of mompound that does k electrolyte" meaning exists as a diator the Sc ions in Sc2(B) 3+	nostly nonionized aci not ionize in solution is that the substance mic molecule? O3? C) 2+ of lithium in Li3PO4	id molecules. n is considered a stro is inert.	D) 3-	11)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the following A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+ 12) Calculate the mass program of a stomic mass A) 30.72 %	olution consists of mompound that does k electrolyte" meaning exists as a diator by the Scients as a diator by 3+ ercent composition is of Li = 6.94 g/mol/B) 17.98 %	nostly nonionized acinot ionize in solution is that the substance in mic molecule? C) 2+ of lithium in Li3PO4 C) 55.27 %	id molecules. In is considered a stro Is inert. In (FW of lithium ph	D) 3- osphate = 115.79	11)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the following A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+ 12) Calculate the mass progen g/mol atomic mass A) 30.72 %	olution consists of mompound that does k electrolyte" meaning exists as a diator by the Scients as a diator by 3+ ercent composition is of Li = 6.94 g/mol/B) 17.98 %	nostly nonionized acinot ionize in solution is that the substance in mic molecule? C) 2+ of lithium in Li3PO4 C) 55.27 %	id molecules. In is considered a stro Is inert. In (FW of lithium ph	D) 3- osphate = 115.79	11)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the following A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+ 12) Calculate the mass prog/mol atomic mass A) 30.72 % 13) What is the empirical A) Hg2(NO3)2	olution consists of mompound that does k electrolyte" meaning exists as a diator by the Scients as a diator by 3+ ercent composition is of Li = 6.94 g/mol/B) 17.98 %	nostly nonionized acinot ionize in solution is that the substance in mic molecule? C) 2+ of lithium in Li3PO4 C) 55.27 %	id molecules. In is considered a stro Is inert. In (FW of lithium ph	D) 3- osphate = 115.79	11)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the followith A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+ 12) Calculate the mass prog/mol atomic mass A) 30.72 % 13) What is the empirical A) Hg2(NO3)2 B) Hg(NO3)2	olution consists of mompound that does k electrolyte" meaning exists as a diator by the Scients as a diator by 3+ ercent composition is of Li = 6.94 g/mol/B) 17.98 %	nostly nonionized acinot ionize in solution is that the substance in mic molecule? C) 2+ of lithium in Li3PO4 C) 55.27 %	id molecules. In is considered a stro Is inert. In (FW of lithium ph	D) 3- osphate = 115.79	11)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the following A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+ 12) Calculate the mass program of the charge of A and A a	olution consists of mompound that does k electrolyte" meaning exists as a diator by the Scients as a diator by 3+ ercent composition is of Li = 6.94 g/mol/B) 17.98 %	nostly nonionized acinot ionize in solution is that the substance in mic molecule? C) 2+ of lithium in Li3PO4 C) 55.27 %	id molecules. In is considered a stro Is inert. In (FW of lithium ph	D) 3- osphate = 115.79	11)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the followith A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+ 12) Calculate the mass prog/mol atomic mass A) 30.72 % 13) What is the empirical A) Hg2(NO3)2 B) Hg(NO3)2	olution consists of mompound that does k electrolyte" meaning exists as a diator by the Scients as a diator by 3+ ercent composition is of Li = 6.94 g/mol/B) 17.98 %	nostly nonionized acinot ionize in solution is that the substance in mic molecule? C) 2+ of lithium in Li3PO4 C) 55.27 %	id molecules. In is considered a stro Is inert. In (FW of lithium ph	D) 3- osphate = 115.79	11)
C) A weak acid so D) A molecular co E) The term "weat 10) Which of the following A) krypton B) phosphorus C) carbon D) lithium E) hydrogen 11) What is the charge of A) 1+ 12) Calculate the mass program of the charge of A and A a	olution consists of mompound that does k electrolyte" meaning exists as a diator by the Scients as a diator by 3+ ercent composition is of Li = 6.94 g/mol/B) 17.98 %	nostly nonionized acinot ionize in solution is that the substance in mic molecule? C) 2+ of lithium in Li3PO4 C) 55.27 %	id molecules. In is considered a stro Is inert. In (FW of lithium ph	D) 3- osphate = 115.79	11)

Dr. Hahn General Chemistry I Lecture Exam II Spring 2015 9:55 form A page 2

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.

Please show all work on the me to grade it, clearly indi					er and wan
 Circle the following pts each) 	compounds wh	hich are <u>ionic</u>	You may circle	e one, many, all or none.	(10 pts, 2
•					
PBr ₃ CCl ₄	BaCl ₂	SiO ₂	Rb ₃ N		
2. Give the name or the pts, 2 pts each)	e formula and o	charge (for the	e polyatomic io	ns) or number for the fol	lowing. (4
pts, 2 pts caony					
		•			
carbonate	·	H ₂ SO ₄ _			_
2 Write out the correct	ionic formula	for the follow	ving Show wo	rk (4 pts total)	
Between the elements:			,g. 2e, ,, ,, e.	(, pos vou)	
Detween the elements.					
Ga and Br					
Charge on Ga is pt explain)	_ Charge on	Br is	(1 pt o	charge) Explain your cha	rges here.(1
Show work for coming up w	ith the correct	tormula here	(1 pt work, 1 p	t correct formula)	
	•				
Dr. Hahn General Chemis	stry I Lecture	Exam II S	pring 2015	(9:55 T,R form A) pa	ige 3

3 If you have the following ionic compound, is the reagent soluble or insol correct choices below to answer this question. (5 pts)	uble in water. Circle t	he
Sr SO ₄		
The anion is [(soluble) or (insoluble)] (circle one) (2.5 pt)		
The ionic compound is [(soluble) or (insoluble)] (circle one) (2.5 pt)		
		4.1°
5. Balance the following reactions by: (6 pts)		
a. filling in the blanks. (you can fill the blank with a one but not a zero) (4	1 pts, 2 pt per blank)	
$Al_2S_3 + 6H_2O \rightarrow $ Al $(OH)_3 + $ H_2S		•
b. show the number count of every atom of each element separately for the 1 pt per blank)	reactant and products (2 pts,
product at on a	- Mest Of	

reactant atom count of

6 a. Given the following reactants, write out the products by filling in the blanks. You do not need to balance the reactions in either part of this question. (4 pt, 2 pts per blank)

$$Ba S + Na_3 PO_4 \rightarrow \underline{\hspace{1cm}} (aq) + \underline{\hspace{1cm}} (s)$$

b. Complete the following complete ionic equation for the same reaction (2 pts, 1 pt per blank)

$$Ba^{+2}(aq) + S^{-2}(aq) + 3 Na^{+1}(aq) + \underline{\qquad}(aq) \rightarrow 3Na^{+1}(aq) + S^{-2}(aq) + \underline{\qquad}(s)$$

7 For the following reactions, circle the limiting reagent. (4 pts)

$$C_3H_7SH + 6 O_2 \rightarrow 3 CO_2 + SO_2 + 4 H_2O$$

Is the limiting reagent [(6 moles of C_3H_7SH) or (6 moles of O_2)] (circle one)?

<u>Part III. Long Answer</u> Please <u>show work</u> 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.****

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work otherwise, I obviously cannot grade work I cannot find.

1. How many atoms of **H** in the molecule $(NH_4)_2O$ is in 235.2 grams of the $(NH_4)_2O$ [FW of $(NH_4)_2O$ = 52.10 g/mol]? (18 pts)

2. If you have 85.2 mL of a solution of concentration 1.5 M and want the new molarity to be 0.75 M, how many mL will the new diluted solution have to be ? $(M_1V_1 = M_2V_2)$ (15 pts)

Dr. Hahn General Chemistry I Lecture Exam II Spring 2015 (9:55 T,R form A) page 7

Multiple of work, I copaper but NA = 6.02 Part I M. No partia	choice questions have obviously cannot grad clearly label where the clearly label where the clear $M_1V_1=M_1$ and M_2 are credit for MC. (2 proposed) Identify the spectate	redit and full credit or e no partial credit. It do it. (2 pts print and the remaining answer M ₂ V ₂ (FW = formulation.) Choose the one altests per question, 26 pto or ions in the followin	Please write anytesign exam) If y can be found. (I la mass or formus rmative that bests total)	hing you want grade ou run out of space, (f I can't find your ans ıla weight)	d legibly. If I cann please continue on t swer, I obviously can	iot read your the scratch inot grade it).
Part I M No partia	MULTIPLE CHOICE. Il credit for MC. (2 p Identify the spectate	. Choose the one alte ts per question, 26 pt	rnative that bes s total)		ment or answers the	e question.
lo partia	al credit for MC. (2 p	ts per question, 26 pl	s total)	t completes the state	ment or answers the	e question.
•	Identify the spectate	-				
	T 12717		g molecular equa	ation.		1)
	LiCl(ac	_I) + AgNO3(aq) → Ag0	Cl(s) + LiNO3(aq)		
	A) Ag ⁺ and Cl ⁻					
	B) Li+ and NO3-	-				
	C) Li ⁺ and Ci ⁻					
	D) Ag ⁺ and NO ₃					
	E) There are no s	spectator ions in this r	eaction.			
2) Calculate the mass	percent composition o	of lithium in Li3P	O ₄ . (FW of lithium p	hosphate = 115.79	2)
•		ss of Li = 6.94 g/mol)				
	A) 17.98 %	B) 20.82 %	C) 55.27 %	D) 30.72 %	E) 26.75 %	
3) Give the name for I	HNO3.				3)
	A) hydrogen nitr B) hydrogen nitr C) hydrogen nitr D) nitrous acid E) nitric acid	rite				
4		ecular formula of a con of NO2. (FW of NO2		s a molar mass of 92.0	g/mol and an	4)
	A) NO ₂	B) N ₃ O ₆	C) N ₂ O ₅	D) N ₂ O ₃	E) N ₂ O ₄	
5) Which of the follow A) krypton	ring exists as a diatom	ic molecule?			5)
	B) carbon C) lithium D) hydrogen E) phosphorus				·	
6) What is the empiric	cal formula for C ₁₂ H ₂ .	4O6?			6)
	A) CHO ₂	в) сно	C) C ₂ H ₄ O	D) C ₂ H ₅ O	E) CH ₂ O	

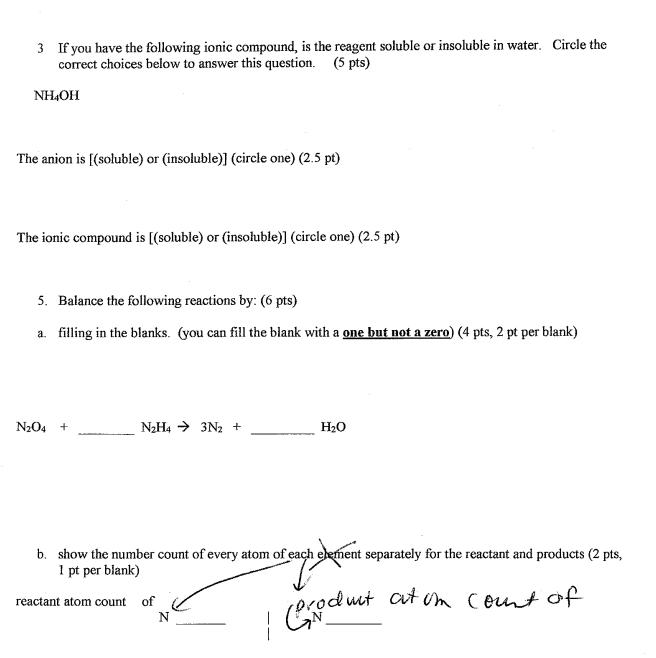
7) Give the name for PBr3	•			7)
A) phosphorus (III) b	romide			
B) potassium tribron				
C) phosphorus brom				
D) phosphorus tribro				
E) phosphorus (II) bi	omiae			
8) Write the name for Ca ₃	(PO ₄) ₂ .			8)
A) calcium (III) phos	phite			
B) calcium phosphate				
C) calcium (II) phosp				
D) tricalcium phosph				
E) calcium phosphite	}			
9) Choose the statement b	elow that is TRUE.			9)
	tion consists of only partially	ionized acid molecules.		
B) A weak acid solut	ion consists of mostly nonion	ized acid molecules.		
C) The term "weak e	lectrolyte" means that the sub	stance is inert.		
D) The term "strong of	electrolyte" means that the su	bstance is extremely read	tive.	
E) A molecular comp	oound that does not ionize in	solution is considered a s	arong electroryte.	
(0) The solid compound, K	2SO4, contains			10)
A) K+ and SO_4 $^{-2}$ ion		B) K_2 ⁺ and SO_4 ⁻² ion	s.	
C) K ₂ SO ₄ molecules		D) K+, S $^{6+}$, and O $^{2-}$ ion	ns.	•
				11)
(1) A covalent bond is best	metal and a polyatomic ion.			11)
	trons between atoms.			
	metal and a nonmetal.			
D) the transfer of elec				
E) a bond between to				
12) What is the empirical fo	ormula for Hg2(NO3)2?			12)
A) Hg ₄ (NO ₃) ₄				
B) Hg2(NO3)2				
C) Hg2NO3				
D) Hg(NO ₃) ₂				
E) HgNO ₃				
13) What is the charge on th		G. 0		13)
A) 1+	B) 2+	C) 3+	D) 3-	

Dr. Hahn

<u>Part II Short Answer</u>: 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.

Please show all work on this exam itself. If you are going to show work on the scratch paper and want me to grade it, clearly indicate where I can find your work. (39 pts)

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1. Circle the following compounds which are covalent You may circle one, many, all or none. (10 pts, 2 pts each)
PBr ₃ CCl ₄ BaCl ₂ SiO ₂ Rb ₃ N
2. Give the name or the formula and charge (for the polyatomic ions) or number for the following. (4 pts, 2 pts each)
3 (as number prefix) phosphate
2 Write out the correct ionic formula for the following. Show work (4 pts total)
Between the elements:
K and P
Charge on K is Charge on P is (1 pt charge) Explain your charges here.(1 pt explain)
Show work for coming up with the correct formula here (1 pt work, 1 pt correct formula)
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6	a.	Given the following reactants, write out the products by filling in the	ne blanks.	You do not need
	to bala	lance the reactions in either part of this question. (4 pt, 2 pts per blank	:)	

Pb
$$(NO_3)_2 + K_2 SO_4 \rightarrow$$
 ______(s)

b. Complete the following complete ionic equation for the same reaction (1 pt) (2 pts, 1 pt per blank)

$$Pb^{+2}(aq) + 2 NO_3^{-1}(aq) + 2 K^{+1}(aq) + SO_4^{-2}(aq) \rightarrow \underline{\qquad} (aq) + 2 NO_3^{-1} \underline{\qquad} (s)$$

7 For the following reactions, circle the limiting reagent. (4 pts)

$$2 \text{ HCl} + \text{Fe} \rightarrow \text{H}_2 + \text{Fe Cl}_2$$

Is the limiting reagent [(2 moles of HCl) or (2 moles of Fe)] (circle one) ?

<u>Part III. Long Answer</u> Please <u>show work</u> 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.****

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1. How many atoms of O in the molecule Al_2 (SO₄)₃ is in 789.2 grams of the Al_2 (SO₄)₃ [FW of Al_2 (SO₄)₃ = 342.17 g/mol]? (18 pts)

2 If you have 25.4 mL of a solution of concentration 0.25 M and want the new molarity to be 0.10 M, how many mL will the new diluted solution have to be? $(M_1V_1 = M_2V_2)$ (15 pts)