

*Use the Scantron for Questions 1-13. Mark only one answer unless instructed otherwise.*

**CHP 6**

1. (6.6) What is the mass percent oxygen in the compound NO?  
A) .875%      B) 87.5%      C) 16.00%      D) 46.68 %      E) 53.32%
2. (6.6) Methane, CH<sub>4</sub>, is a molecular compound. Which of the following is the correct value and units of the molar mass of methane?  
A. 16.0 g/mol      B. 16.0 g/molecule      C. 16.0 amu      D. 16.0 amu/molecule      E. 16.0 g/atom
3. (6.6) What is the molar mass of sodium phosphate?  
A) 226 g      B) 119 g      C) 354 g      D) 308 g      E) 164 g
- (6.7) (5 pt) Calculate the mass of silver in a 1.50 g sample of silver sulfide (Ag<sub>2</sub>S, molar mass = 247.78 g)
- (6.8)(2 pt) The simplest or smallest whole number ratio of the atoms in a compound formula is known as the  
\_\_\_\_\_
- (6.8) (8 pt) An extremely explosive ionic compound is made from the reactions of silver compounds with ammonia. A sample of this compound is found to contain 17.261 g silver and 0.743 g nitrogen. What is the empirical formula for this compound. *Show all work for complete credit.*

(6.8) (4 pt) What is the molecular formula of a compound with empirical formula  $\text{SNCl}_2$  and molecular formula mass = 351 amu?

### CHP 7

*Use the following answers to fill in the blanks in Questions 4-7.*

A) Changed    B) Created    C) Coefficients    D) Subscript    E) There is no answer.

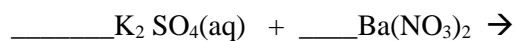
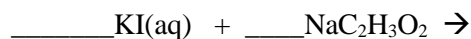
4. When balancing equations we do not change the \_\_\_\_\_ in the formulas.
5. The purpose of the \_\_\_\_\_ placed in front of formulas is to make the number of atoms on the reactant side equal to the number of atoms on the product side.
6. In a chemical reaction atoms are neither created nor destroyed they merely \_\_\_\_\_ partners.
7. When the product of a reaction is \_\_\_\_\_ it is called a precipitate.

(7.1 & 7.3) (6 pt) Balance and name the type of this chemical reaction.



Name \_\_\_\_\_

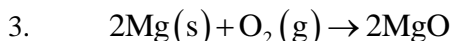
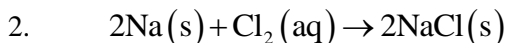
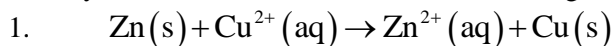
(7.1 & 7.3) (8 pt) Complete and balance each of the following reactions. *Hint: Predict if a precipitate will form. If there is no reaction write **NR**.*



### CHP 9

8. (9.1) When an atom loses an electron, the resulting particle is  
 A) oxidized    B) reduced    C) neutral    D) negatively charged    E) positively charged

9. (9.1) Identify the oxidation-reduction reactions among the following:



A) 1 and 2 only    B) 1 and 3 only    C) 2 and 3 only    D) All of 1, 2, and 3    E) None of 1, 2, and 3

10. (9.2) The oxidation numbers of Mg and O in MgO are:    A) 0,0    B) +2,-2    C) +2,0    D) 0,-2

11. (9.2) In the following reaction,  $\text{Zn(s)} + \text{CuSO}_4(\text{aq}) \rightarrow \text{ZnSO}_4(\text{aq}) + \text{Cu(s)}$

- A) Zn is oxidized and  $\text{Cu}^{2+}$  is reduced.
- B)  $\text{CuSO}_4$  is oxidized and Zn is reduced.
- C)  $\text{ZnSO}_4$  is oxidized and Cu is reduced.
- D)  $\text{Cu}^{2+}$  is oxidized and  $\text{Zn}^{2+}$  is reduced.

***Solid calcium reacts with oxygen gas, forming solid calcium oxide.***

(9.3) (6 pt) Write the balanced equation for this reaction.

(9.3) (2 pt) What is the name of this reaction? \_\_\_\_\_

(9.3) (6 pt) When potassium chlorate is heated it produces oxygen and potassium chloride. Write the balanced equation for this reaction.

(2 pt) What is the name of this reaction? \_\_\_\_\_

(9.3) (7 pt) Propane ( $\text{C}_3\text{H}_8$ ) is used for heating and cooking in some homes. Write the balanced equation for the combustion of propane.

### **CHP 10**

12. (10.1) For the reaction  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$  How much water is produced when 2.5 moles of hydrogen react completely?

- a. 2.5 grams
- b. 18.0 grams
- c. 2.0 moles
- d. 2.5 moles

13. (10.1) For the following reaction:  $\text{Mg}_3\text{N}_2 + 6\text{H}_2\text{O} \rightarrow 3\text{Mg(OH)}_2 + 2\text{NH}_3$

When 2 moles of  $\text{Mg}_3\text{N}_2$  are allowed to react, how many moles of  $\text{H}_2\text{O}$  also react?

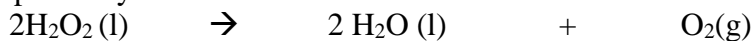
- A) 4 moles
- B) 6 moles
- C) 8 moles
- D) 1 mole
- E) 12 moles

(2 pt) The amount of product that a calculation indicates as possible for a chemical reaction is known as the

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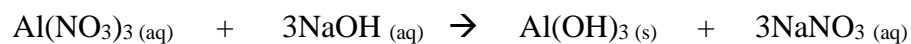
*Show all work for full credit in answering questions. Answers must contain correct significant figures for full credit.*

(10.2) (7 pt) Using the following equation, if 62.5 grams of hydrogen peroxide produce 0.550 mol of oxygen what is the percent yield?.



Molar mass	H <sub>2</sub> O <sub>2</sub> : 34.02 g	H <sub>2</sub> O: 18.02 g	O <sub>2</sub> : 32.00 g
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(10.2 & 10.3) (10 pt) Calculate the grams of aluminum hydroxide obtained from reaction between 105 g sodium hydroxide and 205 g aluminum nitrate according to the following balanced equation:



Molar masses:	213.01 g	40.07 g	78.00 g	85.00 g
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(2 pt) Which reactant is the limiting reactant? \_\_\_\_\_

(4 pt) How many grams of excess reactant will there be?

The following data was obtained from titration of 0.523 g KHP acid with a NaOH solution. Complete the following calculations to determine the molar concentration of the NaOH solution given the following data. The neutralization reaction is  $\text{NaOH} + \text{KHP} \rightarrow \text{KNaP} + \text{H}_2\text{O}$ . Molar masses are NaOH = 40.00 g and KHP = 204.22 g

	TRIAL 1
Initial NaOH level in buret	0.00 mL
Final NaOH level in buret (End point)	20.55 mL
(2 pt) Volume (mL) of NaOH used ( <i>Show calculation</i> )	
(2 pt) Volume in Liters of NaOH used ( <i>Show calculation</i> )	

(4 pt) Moles of KHP used in titration \_\_\_\_\_ mole KHP  
(*Show calculation*)

(2 pt) Moles of NaOH used in titration \_\_\_\_\_ mole NaOH  
(*Show calculation*)

(6 pt) Molarity of NaOH solution \_\_\_\_\_ M NaOH  
(*Show calculation*)

# SCRATCH

## PERIODIC CHART OF THE ELEMENTS

1 H 1.00797																	1 H 1.00797	2 He 4.0026
3 Li 6.939	4 Be 9.0122											5 B 10.811	6 C 12.0112	7 N 14.0067	8 O 15.9994	9 F 18.9984	10 Ne 20.183	
11 Na 22.9898	12 Mg 24.312											13 Al 26.9815	14 Si 28.086	15 P 30.9738	16 S 32.064	17 Cl 35.453	18 Ar 39.948	
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.9216	34 Se 78.96	35 Br 79.909	36 Kr 83.80	
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc [99]	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.904	54 Xe 131.30	
55 Cs 132.905	56 Ba 137.34	*57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59	81 Tl 204.37	82 Pb 207.19	83 Bi 208.980	84 Po (210)	85 At (210)	86 Rn (222)	
87 Fr (223)	88 Ra (226)	†89 Ac (227)	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (262)	108 Hs (265)	109 Mt (266)	110 ? (271)	111 ? (272)	112 ? (277)							

\* Lanthanide Series

58 Ce 140.12	59 Pr 140.907	60 Nd 144.24	61 Pm (147)	62 Sm 150.35	63 Eu 151.96	64 Gd 157.25	65 Tb 158.924	66 Dy 162.50	67 Ho 164.930	68 Er 167.26	69 Tm 168.934	70 Yb 173.04	71 Lu 174.97
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† Actinide Series

90 Th 232.038	91 Pa (231)	92 U 238.03	93 Np (237)	94 Pu (242)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (249)	99 Es (254)	100 Fm (253)	101 Md (256)	102 No (256)	103 Lr (257)
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