EXAM TWO **CHM 203 (Dr. Mattson)** **29 SEPTEMBER 2010**	***Print your name:*** ***Signature:***	***Circle your section:*** ***8:30 9:30***

Instructions: Show all work whenever a calculation is required! You will receive credit for <u>how</u> you worked each problem as well as for the correct answer. If you need more space, you may use the back of your periodic table — Write: "See PT" in box and then attach the periodic table. BOX YOUR ANSWERS! Write legibly.

1. (4 pts) Balance the following reaction.

___ PH_3 +___ O_2 → ___ P_2O_5 + ___ H_2O

2. (4 pts) Write and balance the reaction: Barium bromide and sodium sulfate produce barium sulfate and sodium bromide.

3. (4 pts) Use Avogadro's number to calculate how many hydrogen atoms are in 0.40 mol $(NH_4)_2Cr_2O_7$. Start with "n =" [N = 6.02×10^{23}]

4. Use the following balanced reaction to answer Questions 4a – 4d:

$Xe(g) + 3\ F_2(g) \rightarrow XeF_6(s)$

4a. (4 pts) How many moles of $F_2(g)$ are needed to react with 175 g Xe(g)?

$Xe(g) + 3\ F_2(g) \rightarrow XeF_6(s)$

4b (5 pts) Suppose 200.0 g of $F_2(g)$ is reacted with excess Xe(g). What is the theoretical yield (in grams) of XeF_6?

$Xe(g) + 3\ F_2(g) \rightarrow XeF_6(s)$

4c (4 pts) Suppose 70.0 g Xe(g) +58.0 g $F_2(g)$ were allowed to react. Which is the limiting reagent?

$Xe(g) + 3\ F_2(g) \rightarrow XeF_6(s)$

4d. (5 pts) Continuing with the quantities used in 4c, how many moles of the excess reagent are left over?

$Xe(g) + 3\ F_2(g) \rightarrow XeF_6(s)$

5. (4 pts) Suppose a reaction was performed with a theoretical yield of 0.20 mol $Ca_3(PO_4)_2$ (MM = 310 g/mol). If the experimental yield turned out to be 57 g, what is the percent yield?

6. (4 pts) How many millimoles of copper(II) chloride are in a 75.0 mL sample of 0.1187 M $CuCl_2(aq)$?

7. (5 pts) What is the formula of a compound known to contain only arsenic and sulfur and analyzes for 48.31% As?

8. (6 pts) Which of the following salts are soluble in water? Circle all that are.

$BaCl_2$	$Na_2Cr_2O_7$	$BaSO_4$
CaS	$FeSO_4$	$Ni(OH)_2$

9. (3 pts) Will a precipitate form if the following solutions are mixed?

Yes No $Ca(NO_3)_2(aq)$ and $Na_2CO_3(aq)$

Yes No $AgNO_3(aq)$ and KBr(aq)

Yes No $Pb(C_2H_3O_2)_2(aq)$ and $NaClO_4(aq)$

10. (4 pts) When a solution of copper(II) nitrate is mixed with aqueous potassium carbonate, a precipitate forms. Write the net ionic equation that takes place.

11. (8 pts) Write the formulas for these acids.

A. chloric acid
B. perchloric acid
C. chlorous acid
D. hypochlorous acid
E. sulfuric acid
F. nitric acid
G. bromous acid
H. iodic acid

12. (6 pts) Name these salts. Print.

A. KClO
B. $NaBrO_2$
C. $LiIO_3$
D. $Ca(FO_4)_2$
E. $(NH_4)_2SO_4$
F. $Ca(NO_3)_2$

13. (6 pts) Circle all of the strong electrolytes from this list.

$Ca(NO_3)_2$	$PbSO_4$	$C_{12}H_{22}O_{11}$
LiI	$CuSO_4$	HCl

14. (4 pts) Complete the reaction:

$HNO_3(aq) + KOH(aq) \rightarrow$

Print your name below:

For DocM to complete:

Subtotal from exam: _____

Homework: (20 max) _____

Total: _____

Determine your grade:
A+ ≥ 95; A ≥ 90; B+ ≥ 85; B ≥ 80; C+ ≥ 75; C ≥ 70; D ≥ 60

Answers

1. $2\ PH_3 + 4\ O_2 \rightarrow\ P_2O_5 + 3\ H_2O$

2. $BaBr_2 + Na_2SO_4 \rightarrow\ BaSO_4 + 2\ NaBr$

3. 1.93×10^{24} hydrogen atoms

4a. 4.00 mol $F_2(g)$

4b 430 g XeF_6

4c 0.533 mol Xe and 1.526 mol of F_2. F_2 is the LR.

4d. 0.0244 mol Xe left over

5. 92 %

6. 8.90 mmol $CuCl_2$

7. As_2S_5

8. $BaCl_2$, $Na_2Cr_2O_7$, and $FeSO_4$

9. Yes, Yes, No

10. $Cu^{+2}(aq) + CO_3^{-2}(aq) \rightarrow CuCO_3(s)$

11. A. chloric acid $HClO_3$
B. perchloric acid $HClO_4$
C. chlorous acid $HClO_2$
D. hypochlorous acid HClO
E. sulfuric acid H_2SO_4
F. nitric acid HNO_3
G. bromous acid $HBrO_2$
H. iodic acid HIO_3

12. A. KClO potassium hypochlorite
B. $NaBrO_2$ sodium bromite
C. $LiIO_3$ lithium iodate
D. $Ca(FO_4)_2$ calcium perfluorate
E. $(NH_4)_2SO_4$ ammonium sulfate
F. $Ca(NO_3)_2$ calcium nitrate

13. $Ca(NO_3)_2$, LiI, $CuSO_4$, HCl

14. $HNO_3(aq) + KOH(aq) \rightarrow KNO_3(aq) + H_2O(l)$