

Name _____

Naming and writing chemical formulas is an essential skill to know before starting AP Chemistry. Use your Chemistry notes, [periodic table](#) and the chart on the second page to complete the following problems.

I. Chemical Formulas

1. Write formulas for the following substances:

- a. Barium sulfate _____
- b. Ammonium chloride _____
- c. Chlorine monoxide _____
- d. Silicon tetrachloride _____
- e. Magnesium fluoride _____
- f. Sodium oxide _____
- g. Sodium peroxide _____
- h. Copper (I) iodide _____
- i. Zinc sulfide _____
- j. Potassium carbonate _____
- k. Hydrobromic acid _____
- l. Perchloric acid _____
- m. Lead (II) acetate _____
- n. Sodium permanganate _____
- o. Lithium oxalate _____

2. Name each of the following compounds (Give acid names where appropriate)

- a. CuSO_4 _____
- b. PCl_3 _____
- c. Li_3N _____
- d. BaSO_3 _____
- e. N_2F_4 _____
- f. KClO_4 _____
- g. NaH _____
- h. $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ _____
- i. HNO_2 _____
- j. Sr_3P_2 _____
- k. $\text{Mg}(\text{OH})_2$ _____
- l. Al_2S_3 _____
- m. AgBr _____
- n. P_4O_{10} _____
- o. $\text{HC}_2\text{H}_3\text{O}_2$ _____

II. CHEMICAL REACTIONS

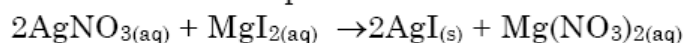
For the following reaction, write the reactants and see if you can predict the products. You may use the following webpage to help you or perform your own search www.google.com to find information on predicting chemical reaction products.

<http://www.nlcs.k12.in.us/bnlhs/staff/coy/notes/c1notes/l6a.pdf> If you can predict the products, balance the equations.

For example:

Solutions of silver nitrate and magnesium iodide are combined.

This is a double replacement reaction.



1. Ammonium sulfate reacts with barium nitrate.
2. Zinc metal is added to a solution of copper (II) chloride.
3. Propane gas (C_3H_8) is burned in excess oxygen.
4. Solid calcium chlorate is heated strongly.
5. Magnesium and nitrogen gas are heated together.
6. Chlorine gas is bubbled through a solution of sodium bromide.
7. Solutions of lead nitrate and calcium iodide are combined.
8. Sulfuric acid is combined with sodium hydroxide.
9. Isopropyl alcohol ($\text{C}_3\text{H}_7\text{OH}$) is burned in oxygen.
10. Iron metal shavings are added to hydrochloric acid.

III. STOICHIOMETRY

1) Find the mass percent of nitrogen in each of the following compounds:

a. NO

b. NO₂

c. N₂O₄

d. N₂O

2) Benzene contains only carbon and hydrogen and has a molar mass of 78.1 g/mol. Analysis shows the compound to be 7.74% H by mass. Find the empirical and molecular formulas of benzene.

- 3) Calcium carbonate decomposes upon heating, producing calcium oxide and carbon dioxide gas.
- Write a balanced chemical equation for this reaction.
 - How many grams of calcium oxide will be produced after 12.25 g of calcium carbonate is completely decomposed?
 - What volume of carbon dioxide gas is produced from this amount of calcium carbonate, at STP?
- 4) Hydrogen gas and bromine gas react to form hydrogen bromide gas.
- Write a balanced chemical equation for this reaction.
 - 3.2 g of hydrogen gas and 9.5 g of bromine gas react. Which is the limiting reagent?
 - How many grams of hydrogen bromide gas can be produced using the amounts in (b)?
 - How many grams of the excess reactant is left unreacted?
 - What volume of HBr, measured at STP, is produced in (b)?

- 5) When ammonia gas, oxygen gas and methane gas (CH_4) are combined, the products are hydrogen cyanide gas and water.
- Write a balanced chemical equation for this reaction.
 - Calculate the mass of each product produced when 225 g of oxygen gas is reacted with an excess of the other two reactants.
 - If the actual yield of the experiment in (b) is 105 g of HCN, calculate the percent yield.
- 6) When solutions of potassium iodide and lead (II) nitrate are combined, the products are potassium nitrate and lead (II) iodide.
- Write a balanced equation for this reaction, including (aq) and (s).
 - Calculate the mass of precipitate produced when 50.0mL of 0.45M potassium iodide solution and 75mL of 0.55M lead (II) nitrate solution are mixed.
 - Calculate the volume of 0.50M potassium iodide required to react completely with 50.0mL of 0.50M lead (II) nitrate.

IV: Polyatomic ions. Make 21 flashcards, one for each of the following polyatomic ions. You will have a series of quizzes in the first 9 weeks, so make sure you study. The first quiz will be in the first week of class.

CATIONS (positive ions)			
+1	+2	+3	+4
AMMONIUM, NH_4^+			
ANIONS (negative ions)			
-1	-2	-3	-4
ACETATE, CH_3COO^-	CARBONATE, CO_3^{2-}	PHOSPHATE, PO_4^{3-}	
BICARBONATE, HCO_3^- (<i>hydrogen carbonate</i>)	CHROMATE, CrO_4^{2-}		
BISULPHATE, HSO_4^- (<i>hydrogen sulphate</i>)	DICHROMATE, $\text{Cr}_2\text{O}_7^{2-}$		
CHLORATE, ClO_3^-	OXALATE, $(\text{COO})_2^{2-}$		
CYANIDE, CN^-	PEROXIDE, O_2^{2-}		
CYANATE, OCN^-	SULPHATE, SO_4^{2-}		
HYDROXIDE, OH^-	SULPHITE, SO_3^{2-}		
NITRATE, NO_3^-	THIOSULPHATE, $\text{S}_2\text{O}_3^{2-}$		
PERCHLORATE, ClO_4^-			
PERMANGANATE, MnO_4^-			
THIOCYANATE, SCN^-			