

AP Chemistry Summer Assignment – Gulf Shores High School

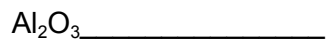
The following assignment is to be completed and brought on the first day of class. **DO NOT SHARE ANSWERS.** We will grade on FIRST DAY OF SCHOOL!!

Nomenclature

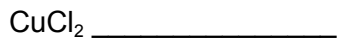
1. **Name** these binary compounds of two **nonmetals**.



2. **Name** these binary compounds with a fixed charge metal.



3. **Name** these binary compounds of cations with variable charge (**Roman Numerals**).



4. **Name** these compounds with polyatomic ions.



$\text{Ca}(\text{ClO}_3)_2$ _____

KNO_2 _____

NaHCO_3 _____

NH_4NO_2 _____

$\text{Cu}_2\text{Cr}_2\text{O}_7$ _____

5. **Name** these binary acids (Hydro -ic acids)

HCl _____

HI _____

6. **Name** these acids with polyatomic ions. (I **-ate** something **-icky** and **Sprite** is delicious)

HClO_4 _____

H_2SO_4 _____

$\text{HC}_2\text{H}_3\text{O}_2$ _____

H_3PO_4 _____

HNO_2 _____

H_2CrO_4 _____

$\text{H}_2\text{C}_2\text{O}_4$ _____

H_2CO_3 _____

7. **Name** these compounds appropriately.

CO _____

NH_4CN _____

HIO_3 _____

NI_3 _____

AlP _____

OF_2 _____

LiMnO_4 _____

HClO _____

HF _____

SO_2 _____

CuCr_2O_7 _____

K_2O _____

FeF_3 _____

$\text{KC}_2\text{H}_3\text{O}_2$ _____

MnS _____

8. **Write** the formulas.

Tin (IV) phosphide _____	copper (II) cyanide _____
Magnesium hydroxide _____	sodium peroxide _____
Sulfurous acid _____	lithium silicate _____
Potassium nitride _____	chromium (III) carbonate _____
Gallium arsenide _____	cobalt (II) chromate _____
Zinc fluoride _____	dichromic acid _____

Solubility rules

9. Review solubility rules and identify each of the following compounds as soluble(aqueous) or insoluble(solid) in water.

Remember: NAG SAG with Castro Bear and PMS exceptions

If its a precipitate, put ppt

If its not, put aq for aqueous

Na_2CO_3 _____	CoCO_3 _____	$\text{Pb}(\text{NO}_3)_2$ _____
K_2S _____	BaSO_4 _____	$(\text{NH}_4)_2\text{S}$ _____
AgI _____	$\text{Ni}(\text{NO}_3)_2$ _____	KI _____
FeS _____	PbCl_2 _____	CuSO_4 _____
Li_2O _____	$\text{Mn}(\text{C}_2\text{H}_3\text{O}_2)_2$ _____	$\text{Cr}(\text{OH})_3$ _____
AgClO_3 _____	$\text{Sn}(\text{SO}_3)_4$ _____	FeF_2 _____

10. Predict whether each of these double replacement reactions will give a precipitate or not based on the solubility of the products. If yes, **identify** the precipitate. If they precipitate, write the **net ionic equation** for each. If no precipitate forms, just put NO RXN.

silver nitrate and potassium chloride _____

magnesium nitrate and sodium carbonate _____

strontium bromide and potassium sulfate _____

cobalt (III) bromide and potassium sulfide _____

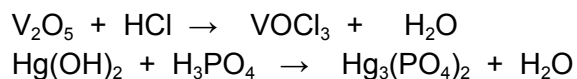
ammonium hydroxide and copper (II) acetate _____

lithium chlorate and chromium (III) fluoride _____

Balancing Equations

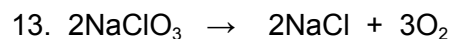
11. Balance the following equations with the lowest whole number coefficients. Identify the type of equation as well: synthesis, decomposition, single replacement, double replacement or combustion.

$\text{S}_8 + \text{O}_2 \rightarrow \text{SO}_3$	TYPE _____
$\text{C}_{10}\text{H}_{16} + \text{Cl}_2 \rightarrow \text{C} + \text{HCl}$	_____
$\text{Fe} + \text{O}_2 \rightarrow \text{Fe}_2\text{O}_3$	_____
$\text{C}_7\text{H}_6\text{O}_2 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$	_____
$\text{KClO}_3 \rightarrow \text{KCl} + \text{O}_2$	_____
$\text{H}_3\text{AsO}_4 \rightarrow \text{As}_2\text{O}_5 + \text{H}_2\text{O}$	_____

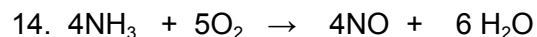


Stoichiometry and Limiting Reactants

12. Given the equation below, what **mass** of water would be needed to react with 10.0g of sodium oxide?

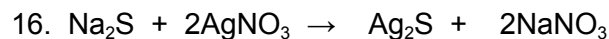


What **mass** of sodium chloride is formed along with 45.0g of oxygen gas?



What **mass** of water will be produced when 100.0g of ammonia is reacted with **excess** oxygen?

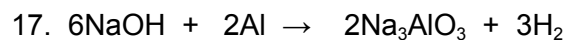
15. If the reaction in #14 is done with 25.0g of each reactant, which would be the limiting reactant?



If the above reaction is carried out with 50.0g of sodium sulfide and 35.0g of silver nitrate, which is the limiting reactant?

What mass of the excess reactant remains?

What mass of silver sulfide would precipitate?



What **volume** of hydrogen gas (measured at STP) would result from reacting 75.0g of sodium hydroxide with 50.0g of aluminum?

ACID-BASE

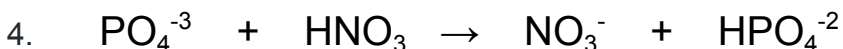
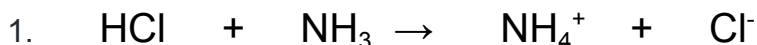
18. Write a balanced equation for the reaction between NaOH and HCl. Use this equation to answer problems 19-21

19. If it takes 26 mL of 1.5 M NaOH to neutralize 175 mL of an HCl solution, what is the concentration of the HCl?

20. If it takes 25 mL of 0.05 M HCl to neutralize 75 mL of NaOH solution, what is the concentration of the NaOH solution?

21. A 25.0 mL sample of HCl was titrated to the endpoint with 15.0 mL of 2.0 M NaOH. What is the molarity of HCl?

22. Label the acid, the base, the conjugate acid, and the conjugate base in each of the equations.



6. Write an equation that shows the reaction of ammonia, NH_3 with hydrobromic acid, HBr. Label the acid, the base, the conjugate acid, and the conjugate base.

Solve the following pH calculations. Write the formula, plug numbers into formula, & give answers with correct units and significant figures.

23. If the pH of a solution is 10.3, what is the $[H^+]$ concentration?

24. If the $[H^+]$ is 2.1×10^{-12} M $HClO_4$, what is the pH? Is the solution ACIDIC, BASIC, or NEUTRAL?

25. What is the pH of a 0.033 M KOH solution?

26. Determine the concentration of $[OH^-]$ ions in an aqueous solution where the pH = 5.22.

27. Calculate the pH of a solution that is 0.357 M HCl?

28. What is the hydroxide ion concentration in an aqueous solution with a hydrogen ion concentration of 2.70×10^{-2} M?

29. Explain how to calculate pH, pOH, $[H^+]$ and $[OH^-]$. How is pH related to pOH?

30. Determine the concentration of $[H^+]$ ions in an aqueous solution where the pOH = 3.98.