

STOCKBRIDGE HIGH SCHOOL
AP Chemistry Summer Assignment—School year 2018-2019
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Students may use Chemistry books and online resources to complete assignment.
Due Date: The following assignment is to be completed and brought on the first day of class.

Nomenclature

1. Name these binary compounds of two nonmetals.

IF ₇ _____	N ₂ O ₅ _____	XeF ₂ _____
N ₂ O ₄ _____	As ₄ O ₁₀ _____	SF ₆ _____
PCl ₃ _____	S ₂ Cl ₂ _____	

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

AlCl ₃ _____	MgO _____	BaI ₂ _____
KI _____	SrBr ₂ _____	Na ₂ S _____
CaF ₂ _____	Al ₂ O ₃ _____	

3. Name these binary compounds of cations with variable charge.

CuCl ₂ _____	Fe ₂ O ₃ _____	SnO _____
PbCl ₄ _____	Cu ₂ S _____	HgS _____
AuI ₃ _____	CoP _____	

4. Name these compounds with polyatomic ions.

Fe(NO ₃) ₃ _____	NaOH _____	Cu ₂ SO ₄ _____
Ca(ClO ₃) ₂ _____	KNO ₂ _____	NaHCO ₃ _____
NH ₄ NO ₂ _____	Cu ₂ Cr ₂ O ₇ _____	

5. Name these binary acids

HCl _____	HI _____
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6. Name these acids with polyatomic ions.

HClO ₄ _____	H ₂ SO ₄ _____	HC ₂ H ₃ O ₂ _____
H ₃ PO ₄ _____	HNO ₂ _____	H ₂ CrO ₄ _____
H ₂ C ₂ O ₄ _____	H ₂ CO ₃ _____	

7. Name these compounds appropriately.

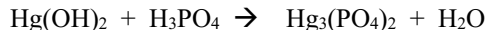
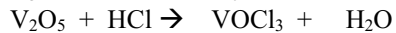
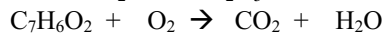
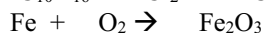
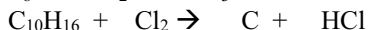
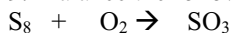
CO _____	NH ₄ CN _____	HIO ₃ _____	NI ₃ _____
AlP _____	OF ₂ _____	LiMnO ₄ _____	HClO _____
HF _____	SO ₂ _____	CuCr ₂ O ₇ _____	K ₂ O _____
FeF ₃ _____	KC ₂ H ₃ O ₂ _____	MnS _____	

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 _____

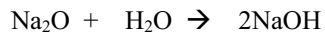
Balancing Equations

9. Balance the following equations with the lowest whole number coefficients.



Stoichiometry and Limiting Factor

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



11. $2\text{NaClO}_3 \rightarrow 2\text{NaCl} + 3\text{O}_2$

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

12. $4\text{NH}_3 + 5\text{O}_2 \rightarrow 4\text{NO} + 6\text{H}_2\text{O}$

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

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

14. $\text{Na}_2\text{S} + 2\text{AgNO}_3 \rightarrow \text{Ag}_2\text{S} + 2\text{NaNO}_3$

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

What mass of the excess reactant remains?

What mass of silver sulfide would precipitate?

15. $6\text{NaOH} + 2\text{Al} \rightarrow 2\text{Na}_3\text{AlO}_3 + 3\text{H}_2$

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

Empirical Formulas Calculations

16. A compound is 64.9% carbon, 13.5% hydrogen and 21.6% oxygen. Its molecular mass is 74 g/mol. What is its molecular formula?

17. A 2.5g sample of a hydrate of $\text{Ca}(\text{NO}_3)_2$ was heated, and only 1.7 g of the anhydrous salt remained. What percentage of water was in the hydrate?

18. A 5.0g sample of a copper II nitrate hydrate is heated, and 3.9g of the anhydrous salt remains. Determine the formula of the hydrate.

Solubility rules

19. Review solubility rules and identify each of the following compounds as soluble or insoluble in water.

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 _____

20. Write a complete balanced equation of the following then predict whether each of these double displacement reactions will give a precipitate or not based on the solubility of the products. If yes, identify the precipitate.

- 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 -----