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_2O_5_____ XeF_2 _____
N_2O_4_____ As_4O_{10}_____ SF_6_____
PCl_3_____ S_2Cl_2_____

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

$AlCl_3$ _____ MgO_____ BaI_2_____
KI_____ $SrBr_2$ _____ Na_2S _____
CaF_2 _____ Al_2O_3_____

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

$CuCl_2$ _____ Fe_2O_3_____ SnO_____
$PbCl_4$_____ Cu_2S_____ HgS_____
AuI_3_____ CoP_____

4. Name these compounds with polyatomic ions.

$Fe(NO_3)_3$_____ NaOH_____ Cu_2SO_4_____
$Ca(ClO_3)_2$_____ KNO_2_____ $NaHCO_3$_____
NH_4NO_2_____ $Cu_2Cr_2O_7$ _____

5. Name these binary acids

HCl _____ HI _____

6. Name these acids with polyatomic ions.

$HClO_4$_____ H_2SO_4_____ $HC_2H_3O_2$_____
H_3PO_4_____ HNO_2_____ H_2CrO_4_____
$H_2C_2O_4$_____ 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_____ $KC_2H_3O_2$_____ 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.

$S_8 + O_2 \rightarrow SO_3$

$C_{10}H_{16} + Cl_2 \rightarrow C + HCl$

$Fe + O_2 \rightarrow Fe_2O_3$

$C_7H_6O_2 + O_2 \rightarrow CO_2 + H_2O$

$KClO_3 \rightarrow KCl + O_2$

$H_3AsO_4 \rightarrow As_2O_5 + H_2O$

$V_2O_5 + HCl \rightarrow VOCl_3 + H_2O$

$Hg(OH)_2 + H_3PO_4 \rightarrow Hg_3(PO_4)_2 + H_2O$

Stoichiometry and Limiting Factor

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

$Na_2O + H_2O \rightarrow 2NaOH$

11. $2NaClO_3 \rightarrow 2NaCl + 3O_2$

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

12. $4NH_3 + 5O_2 \rightarrow 4NO + 6\ H_2O$

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. $Na_2S + 2AgNO_3 \rightarrow Ag_2S + 2NaNO_3$

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. $6NaOH + 2Al \rightarrow 2Na_3AlO_3 + 3H_2$

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 $Ca(NO_3)_2$ 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_____	$CoCO_3$_____	$Pb(NO_3)_2$_____
K_2S_____	$BaSO_4$_____	$(NH_4)_2S$ _____
AgI_____	$Ni(NO_3)_2$_____	KI_____
FeS_____	$PbCl_2$_____	$CuSO_4$_____
Li_2O_____	$Mn(C_2H_3O_2)_2$_____	$Cr(OH)_3$_____
$AgClO_3$ _____	$Sn(SO_3)_4$ _____	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.

a. Silver nitrate and potassium chloride ----------

b. Magnesium nitrate and sodium carbonate ----------

c. Strontium bromide and potassium sulfate ----------

d. Cobalt (III) bromide and potassium sulfide ----------

e. Ammonium hydroxide and copper (II) acetate ----------

f. Lithium chlorate and chromium (III) fluoride ----------