AP Chemistry

Summer Assignment

Dacula High School

****The following assignment is to be completed and brought on the first day of class****

Please contact Ms. Zoino at Allison_Zoino@gwinnett.k12.ga.us with any questions!

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_____

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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. We did not cover solubility rules in Honors Chemistry, but do a little research and see if you can 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_____

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. Remember that a double replacement reaction means that the two cations switch – remember to balance your charges!

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.

___S_8 + ___ O_2 → ___SO_3
___$C_{10}H_{16}$ + ___ Cl_2 → ___C + ___ HCl
___Fe + ___O_2 → ___Fe_2O_3
___$C_7H_6O_2$ + ___O_2 → ___ CO_2 + ___ H_2O
___$KClO_3$ → ___ KCl + ___ O_2
___ H_3AsO_4 → ___ As_2O_5 + ___ H_2O
___ V_2O_5 + ___HCl → ___$VOCl_3$ + ___ H_2O
___ $Hg(OH)_2$ + ___ H_3PO_4 → ___ $Hg_3(PO_4)_2$ + ___ H_2O

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Stoichiometry and Limiting Factor – Be sure to SHOW YOUR WORK!

12. Given the equation below, what mass of water would be needed to react with 10.0g of sodium oxide?
    $Na_2O + H_2O \rightarrow 2NaOH$

13. $2NaClO_3 \rightarrow 2NaCl + 3O_2$
    What mass of sodium chloride is formed along with 45.0g of oxygen gas?

14. $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$
    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 factor?

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

17. $6NaOH + 2Al \rightarrow 2Na_3AlO_3 + 3H_2$
    What volume of hydrogen gas (measured at STP) would result from reacting 75.0g of sodium hydroxide with 50.0g of aluminum?