**Spring Benchmark #1 Review Questions – C6 and C7 – Balancing equations, types of reactions, predicting products, molar conversions, and stoichiometry**

**Balance the following equations using the smallest whole numbers possible. On the left, classify each reaction as synthesis (S), decomposition (D), single replacement (SR), double replacement (DR), or combustion (C).**

\_\_S\_\_ 1) \_\_\_Mg(s) + \_\_\_O2(g) —> \_\_\_MgO(s)

\_\_\_\_\_ 2) \_\_\_C8H18(g) + \_\_\_O2(g) —> \_\_\_CO2(g) + \_\_\_H2O(g)

\_\_\_\_\_ 3) \_\_\_Cu(s) + \_\_\_H2O(g) —> \_\_\_H2(g) + \_\_\_Cu2O

\_\_\_\_\_ 4) \_\_\_AgCl (aq) + \_\_\_H2S(aq) —> \_\_\_Ag2S(s) + \_\_\_HCl(aq)

\_\_\_\_\_ 5) \_\_\_CaCO3(s) —> \_\_\_CaO(s) + \_\_\_CO2(g)

\_\_\_\_\_ 6) \_\_\_Cu(s) + \_\_\_S8(s) —> \_\_\_CuS(s)

\_\_\_\_\_ 7) \_\_\_H2S(aq) + \_\_\_NaOH(aq) —> \_\_\_H2O(l) + \_\_\_Na2S(aq)

\_\_\_\_\_ 8) \_\_\_\_Al2(SO4)3 + \_\_\_\_ Ca(OH)2 —> \_\_\_\_Al(OH)3 + \_\_\_\_ CaSO4

\_\_\_\_\_ 9) \_\_\_ Al + \_\_\_ HCl —> \_\_\_AlCl3 + \_\_\_ H2**Complete each Q by identifying the type of reaction that takes place, naming the predicted products, and then writing the formulas for the products. You do NOT need to write the equation or balance it!**

| Q# | Type | Reactants | Names of Predicted Products | Formulas of Predicted Products |
| --- | --- | --- | --- | --- |
| 10 | D | potassium chlorate | potassium chloride + oxygen  | KCl + O2 |
| 11 |  | aluminum nitrate + sodium hydroxide |  |  |
| 12 |  | ammonium nitrite | nitrogen + water |  |
| 13 |  | iron(III) bromide + ammonium sulfide |  |  |
| 14 |  | calcium oxide + diphosphorus pentoxide | calcium phosphate |  |
| 15 |  | aluminum + copper (II) chloride |  |  |
| 16 |  | bromine + magnesium iodide |  |  |
| 17 |  | sodium bicarbonate | sodium oxide + carbon dioxide + water |  |
| 18 |  | aluminum + oxygen |  |  |
| 19 |  | iron (II) + silver acetate |  |  |

#### For the following problems, calculate the number of moles per sample. Show your work on your notebook paper

#### How many grams in two moles of sodium?

#### How many moles in 12.01g of carbon?

#### How many molecules in 6.005g of carbon dioxide?

#### If you have 20g of Boron how many atoms of boron do you have

#### If you have one mole of hydrogen gas how many atoms do you have?

*In the following problems,* **BALANCE THE EQUATION** *and then calculate how much of the indicated product is made.* ***Show all of your work on your notebook paper.***

25) LiOH + HBr —> LiBr + H2O

 (a) If you start with ten grams of lithium hydroxide, how many grams of lithium bromide will be
 produced? (*36.26 g LiBr*)
(b) If you start with 12 moles of hydrogen bromide, how many molecules of lithium bromide will be
 produced?

26) C2H4 + O2 —> CO2 + H2O

 (a) If you start with 45 grams of ethylene (C2H4), how many grams of carbon dioxide will be produced?
 (*141.2 g CO2*)
(b) If you start with 6.2 x 1026 molecules of ethylene (C2H4), how many molecules of water will be
 produced?

27) LiCl + CaSO4 —> CaCl2 + Li2SO4

 (a) If you start with 5.5 moles of lithium chloride, how many grams of calcium chloride will be
 produced?
(b) If you start with 0.56 moles of Calcium Sulfate, how many moles of Lithium Sulfate will be
 produced?

28) HCl + Na2SO4 —> NaCl + H2SO4

 (a) If you start with 20 grams of hydrochloric acid, how many molecules of sulfuric acid will be
 produced?
(b) If you start with 0.95 grams of hydrochloric acid, how many moles of salt will be produced?

29) FeCr2O7 + K2CO3 + O2 —> Fe2O3 + K2CrO4 + CO2

(a) How many grams of FeCr2O7 are required to produce 3.95 x 1032 molecules of CO2?

(b) How many grams of O2 are required to produce 100.0 g of Fe2O3?

30) Pick the top two topics that are difficult for you and write them here. BE SPECIFIC!

 1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

You must do ten minutes of independent studying for each of those topics (twenty minutes total). On your notebook paper you must show evidence of this studying. You can use any resource you like, just make sure to tell me what it was and include your evidence such as: work for practice problems, scratch paper for an online practice test, a paragraph summarizing a YouTube video, etc. Remember that the class website has lots of resources!