Gen Chem Unit 7 - Chemical Reaction - Mandatory Packet Name _____KEY_____

Learning Target 2

1. Write the general equation and an example for the following reactions.

Type of Rxn	General Equation	Example
Synthesis	A + B → AB	Come up with one on your own
Decomposition	AB → A + B	Look in your notes if you need to
Single Replacement	AB + C → AC + B	
Double Replacement	AB + CD → AD + CB	
Combustion	$C_?H_?$ + O_2 → CO_2 + H_2O	

Learning Target 1 and 3

2. What is the law of conservation of mass. Why does it matter when balancing chemical equations?

Mass can't be created or destroyed. This is important when balancing chemical equations because the mass and matter that you start with must be the same as when you finish a reaction. The reactants must equal the products.

3. **Balance the following equations** **Determine the Type of Rxn**

_2__Fe + _3__H_2SO_4 → ___$Fe_2(SO_4)_3$ + _3 H_2 __single_____

_2__C_2H_6 + _7__O_2 → _6_H_2O + 4 CO_2 __Combustion____

___KOH + ___H_3PO_4 → ___K_3PO_4 + ___H_2O _____Double_____

___SnO_2 + ___H_2 → ___Sn + ___H_2O _____Single_____

_2__NH_3 + _2 O_2 → ___NO + 3H_2O Double?? Not always obvious!

__2_KNO_3 + ___H_2CO_3 → ___ K_2CO_3 + _2__HNO_3 _____Double_____

___B_2Br_6 + ___HNO_3 → ___$B(NO_3)_3$ + ___HBr _____Double_____

__2_GaF_3 + _3__Li_2SO_3 → ___$Ga_2(SO_3)_3$ + _6__LiF Double

___$(NH_4)_3PO_4$ + ___$Pb(NO_3)_4$ → ___$Pb_3(PO_4)_4$ + ___NH_4NO_3 _____Double_____

___$SeCl_6$ + ___O_2 → ___SeO_2 + _3__Cl_2 _____Single_____

Need more practice? Do the Balancing Equations WS

4. Write and Balance the following word equations

a. Hydrogen and oxygen react to form water.

$2H_2 + O_2 \rightarrow 2H_2O$

b. Zinc reacts with sulfuric acid to produce zinc sulfate and hydrogen

$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

c. Bromine and potassium chloride are produced in the reaction of potassium bromide with chlorine gas.

$KBr + Cl_2 \rightarrow Br_2 + 2KCl$

d. Selenium hexachloride reacts with oxygen to produce selenium dioxide and chlorine.

$SeCl_6 + O_2 \rightarrow SeO_2 + 3Cl_2$

e. Lead reacts with Iron (II) sulfate to produce lead (II) sulfate and iron.

$Pb + FeSO_4 \rightarrow PbSO_4 + Fe$

Need more practice? Do the Word Equation WS

5. a. Write the chemical reaction for the combustion of octene (C_8H_{16})

$C_8H_{16} + 12O_2 \rightarrow 8CO_2 + 8H_2O$

b. What is the empirical formula for octene? __CH_2_____

6. Use correct nomenclature to write word equations from the last 3 equations that you balanced in question #3.

Gallium fluoride reacts with lithium sulfite to produce gallium sulfite and lithium fluoride.

Ammonium phosphate reacts with lead (IV) nitrate to produce Lead(IV) phosphate and ammonium nitrate.

Selenium hexachloride reacts with oxygen to produce selenium and chlorine.

Learning Target 4

7. Predict the product of the following reactions using the activity series. Balance the equations. If no reaction takes place, indicate why.

a. $2Cd + H_2O \rightarrow 2Cd(OH)_2 + H_2$ (the water must be _steam_____)

b. $2\ Co^{3+} + 3H_2SO_4 \rightarrow Co_2(SO_4)_3 + 6H_2$

c. $2Pb^{2+} + O_2 \rightarrow 2PbO$

d. $Ni + H_2O \rightarrow$ no reaction

e. $Al(NO_3)_3 + Ni \rightarrow$ no reaction

8. Predict the products of the following reactions and balance the equations.

a. $Ca(NO_3)_2 + 2\ NaBr \rightarrow 2NaNO_3 + CaBr_2$

b. $2AlF_3 + 3Na_2SO_4 \rightarrow Al_2(SO_4)_3 + 6NaF$

c. $C_5H_{12} + 8O_2 \rightarrow 5CO_2 + 6H_2O$

d. $2Mg + O_2 \rightarrow 2MgO$

e. $2H_2 + O_2 \rightarrow 2H_2O$

f. $2AlCl_3 \rightarrow 2Al + 3Cl_2$

Need more practice? Do the Predicting Products WS 2