For each of the following reactions, write the formula equation and balance.

18. Ammonia reacts with hydrogen chloride to form ammonium chloride.

19. When heated, calcium carbonate decomposes to form calcium oxide and carbon dioxide.

$$\_\ CaCO_3 \xrightarrow{\Delta} \_\ CaO + \_\ CO_2$$

20. Barium oxide reacts with water to form barium hydroxide.

21. Acetaldehyde (CH_3CHO) decomposes to form methane (CH_4) and carbon monoxide.

$$\_\ CH_3CHO \longrightarrow \_\ CH_4 + \_\ CO$$

22. Zinc reacts with copper (II) nitrate to form zinc nitrate and copper.

23. When heated, calcium sulfite decomposes to form calcium oxide and sulfur dioxide.

$$\_\ CaSO_3 \xrightarrow{\Delta} \_\ CaO + \_\ SO_2$$

24. Iron reacts with sulfuric acid to form iron (II) sulfate and hydrogen gas.

25. Carbon monoxide reacts with chlorine gas to form phosgene ($COCl_2$)

$$\_\ CO + \_\ Cl_2(g) \rightarrow \_\ COCl_2$$

26. Aluminum sulfate reacts with ammonium bromide to produce aluminum bromide and ammonium sulfate.

27. Potassium fluoride and barium bromide react to yield barium fluoride and potassium bromide.

$$2\ KF + \_\ BaBr_2 \rightarrow \_\ BaF_2 + 2\ KBr$$

28. Cupric nitrate and ammonium hydroxide react to form cupric hydroxide and ammonium nitrate

29. Sodium nitrate when heated decomposes to form sodium nitrite and oxygen gas.

$$2\ NaNO_3 \xrightarrow{\Delta} 2\ NaNO_2 + \_\ O_2(g)$$

30. Lead hydroxide when heated decomposes to produce lead monoxide and water.

The student will be able to:

1. Identify the parts of an chemical reaction.
2. Balance an equation using cofficients.
3. Calculate quantities of a substance in a chemical reaction.
4. Write a chemical equation starting with the chemical names -> written formulas -> balanced reaction
5. Identify the type of reaction.
6. Predict the products.

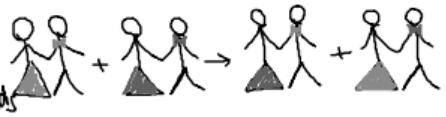
Homework: Types of Rxns
1-10 at Top, 2-20 EVEN
Skip #16

3/13

Types of Chemical Reactions:

1). Direct Combination (DC) synthesis
2 single elements (Reactants)
* Key outcome → ONE PRODUCT

2.) Single replacement (SR)
1 compound + 1 single element (React.)
the single must be more active for the reaction to occur.
(if less active - no reaction)
* LIKE REPLACES LIKE *



3.) Double Replacement (DR)
2 compounds (React.) → 2 new compounds (product)
metals (cations) trade places.

4.) Decomposition (DEC)
1 compound (Reactant) → multiple products. heat required Δ →

5.) Combustion
Organic: $\_CH_4 + 2O_2(g) \rightarrow \_CO_2 + 2H_2O + \underline{\text{Heat}}$ (Heat = product)

non-organic: $4Li + \_O_2(g) \rightarrow 2\,Li_2O$ (oxide)

Haber Process: $N_2(g) + 3H_2(g) \rightarrow 2\,NH_3$

$NH_4OH \rightarrow NH_3 + H_2O$

Practice:

1. DC
2. DR
3. DC
4. DR
5. SR
6. DC
7. SR
8. SR
9. DC
10. DC

1. Decide Type of Rxn
2. Decide on Product
3. Complete word problem (on the line)
4. Write balanced equation.

DC 1. sodium + iodine gas → sodium iodide

$2\,Na + I_2(g) \rightarrow 2\,NaI$

DC 2. calcium + oxygen gas → calcium oxide

DC 3. hydrogen gas + chlorine gas → hydrogen chloride gas

$H_2(g) + Cl_2(g) \rightarrow 2\,HCl(g)$

SR 7. aluminum + sulfuric acid → hydrogen gas + aluminum sulfate (aq)

$2\,Al(s) + 3\,H_2SO_4(aq) \rightarrow 3\,H_2(g) + Al_2(SO_4)_3$

8. potassium iodide + chlorine (gas) → iodine gas + potassium chloride

$2\,KI + Cl_2(g) \rightarrow I_2(g) + 2\,KCl$

9. iron (II) + copper (II) nitrate → _____

10. silver nitrate + zinc chloride → zinc nitrate + silver chloride

$2\ AgNO_3 + \_\ ZnCl_2 \rightarrow \_\ Zn(NO_3)_2 + 2\ AgCl$

11. copper (II) hydroxide + acetic acid → copper (II) acetate + water

$\_\ Cu(OH)_2 + 2\ HC_2H_3O_2(aq) \rightarrow \_\ Cu(C_2H_3O_2)_2 + 2\ H(OH)$

12. iron (II) sulfate + ammonium sulfide → _____

13. cobalt (II) + oxygen gas → _____

14. potassium chloride + silver nitrate → _____

15. calcium oxide + water → _____

16. sodium hydroxide + hydrochloric acid → _____

17. hydrogen gas + nitrogen gas → _____

18. silver nitrate + nickel → _____