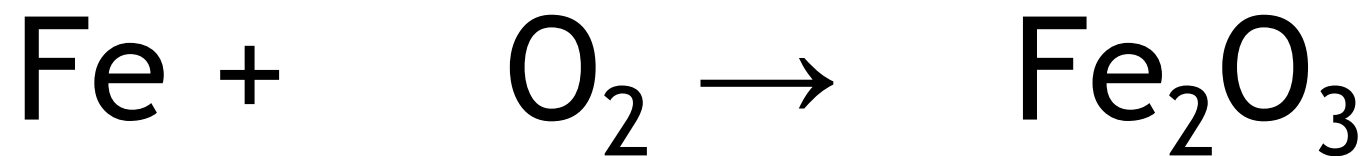


BALANCING REVIEW AND TYPES OF REACTIONS

Unit 5

BALANCING = TRIAL AND ERROR!



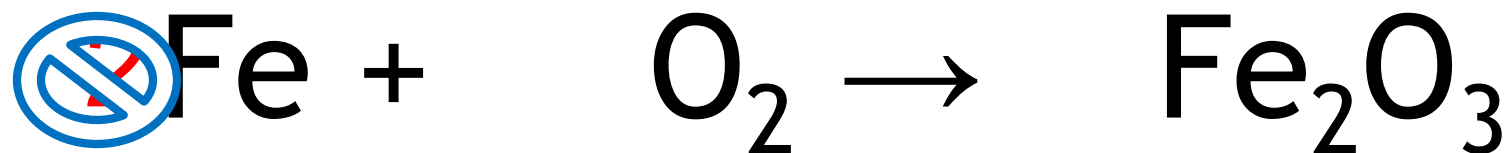
$$\text{Fe} = 1$$

$$\text{Fe} = 2$$

$$\text{O} = 2$$

$$\text{O} = 3$$

BALANCING = TRIAL AND ERROR!



$$\text{Fe} = 1$$

$$\text{Fe} = 2$$

$$\text{O} = 2$$

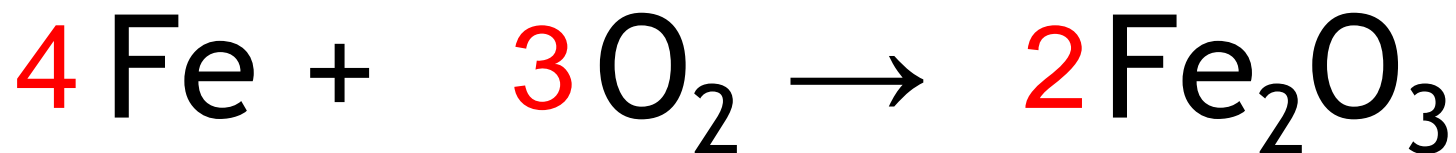
$$\text{O} = 3$$

NO GOOD!!!!

Oxygen can't be balanced!

BALANCING = TRIAL AND ERROR!

Work with oxygen and go to least common multiple!



$$\text{Fe} = \cancel{1} 4$$

$$\text{Fe} = \cancel{2} 4$$

$$\text{O} = \cancel{2} 6$$

$$\text{O} = \cancel{3} 6$$

BALANCED!!!!

BALANCING WITH POLYATOMICS!



$$\text{NH}_4 = 1$$

$$\text{NH}_4 = 2$$

$$\text{OH} = 1$$

$$\text{OH} = 1$$

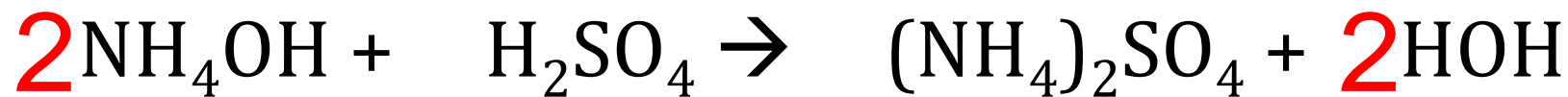
$$\text{H} = 2$$

$$\text{H} = 1$$

$$\text{SO}_4 = 1$$

$$\text{SO}_4 = 1$$

BALANCING WITH POLYATOMICS!



$$\text{NH}_4 = \cancel{1} 2$$

$$\text{NH}_4 = 2$$

$$\text{OH} = \cancel{1} 2$$

$$\text{OH} = \cancel{1} 2$$

$$\text{H} = 2$$

$$\text{H} = \cancel{1} 2$$

$$\text{SO}_4 = 1$$

$$\text{SO}_4 = 1$$

BALANCED!!!!

BALANCING PRACTICE

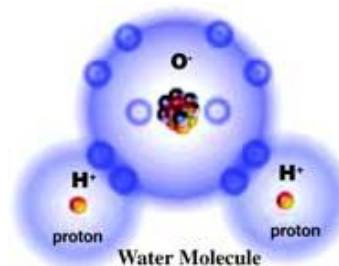
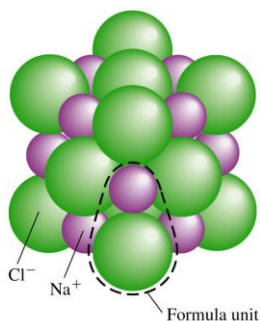
TYPES OF REACTIONS

TYPES OF REACTIONS

- There are millions of chemical reactions, but we can classify them into ***five*** main types of reactions:
 - ***Synthesis***
 - ***Decomposition***
 - ***Single Displacement***
 - ***Double Displacement***
 - ***Combustion***

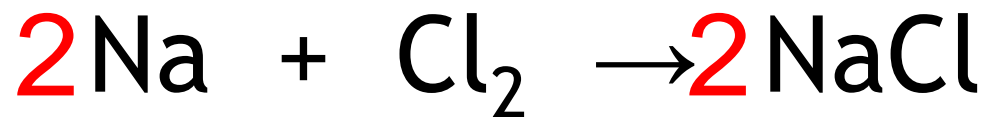
SYNTHESIS REACTIONS

- Two or more substances *combine* to form another substance



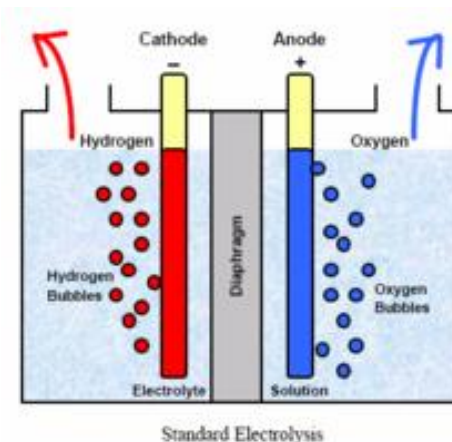
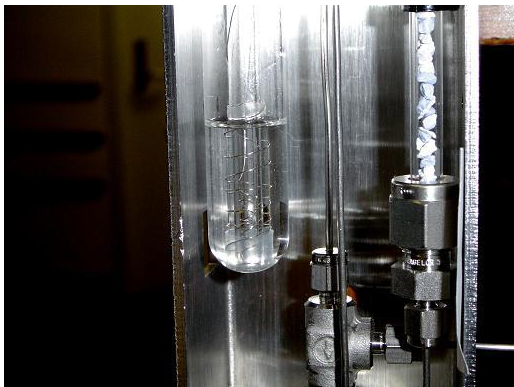
SYNTHESIS REACTIONS

Balance the following:



DECOMPOSITION REACTIONS

- One substance decomposes, or **breaks down**, into two or more substances



DECOMPOSITION REACTIONS

Balance the following:



BALANCED!!!!



SINGLE DISPLACEMENT

- One element *replaces* another element in a compound



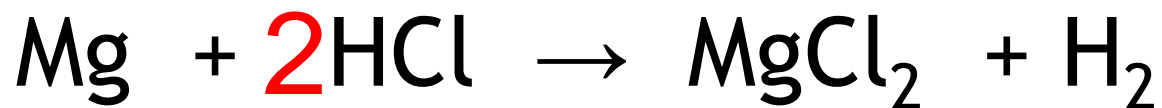
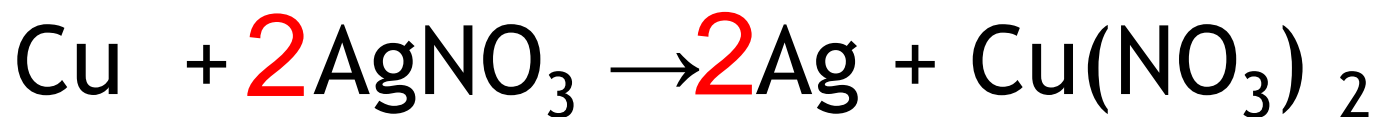
Single
Displacement:



An element reacts with a compound to form a new element and a different compound. The reactant element "displaces" an element in the compound that is the most chemically similar. For example, a metal will replace a different metal.

SINGLE DISPLACEMENT

Balance the following:



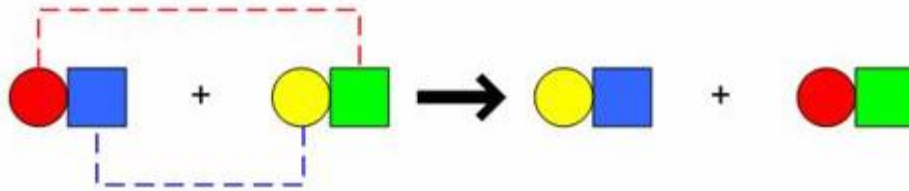
DOUBLE DISPLACEMENT

- The *positive* ions of two compounds *switch* with each other to form two new compounds
- Occur in *solutions*
- A *precipitate*, *water*, or a *gas* is formed

DOUBLE DISPLACEMENT

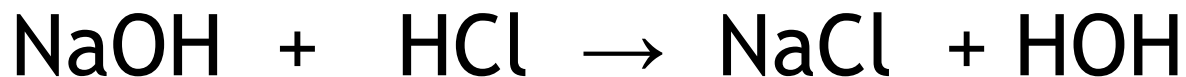
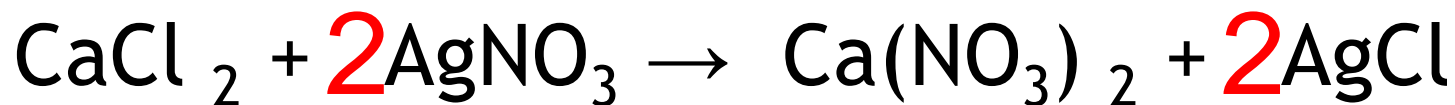


Double
Displacement:



DOUBLE DISPLACEMENT

Balance the following:



BALANCED!!!!

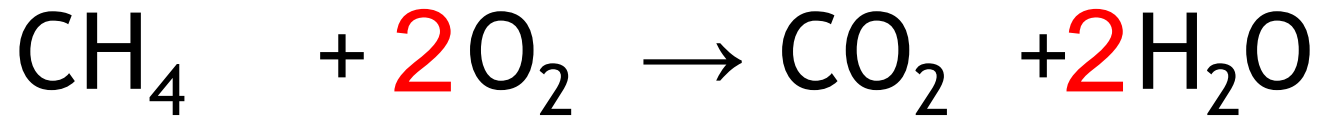
COMBUSTION

- A *carbon* based substance reacts with oxygen to produce energy in the form of heat and light and CO_2 and H_2O .
- aka burning



COMBUSTION

Balance the following:



QUESTIONS TO ASK ...

- Is there one product?

Synthesis

- Is there one reactant?

Decomposition

QUESTIONS TO ASK ...

- Are CO_2 and H_2O two of the Products?

Combustion

- Is one element that is by itself replacing another in a compound?

Single Replacement

- Are there only compounds that switch ions?

Double Replacement