

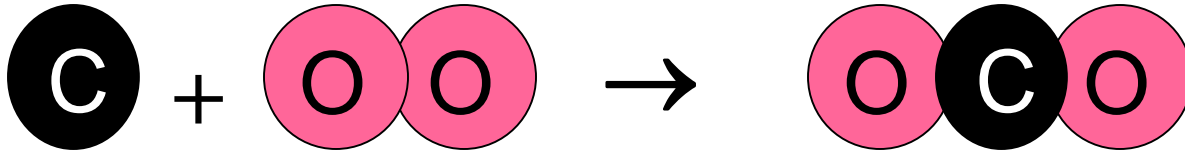
Types of Reactions

1. Synthesis reactions
2. Decomposition reactions
3. Single displacement reactions
4. Double displacement reactions
5. Combustion reactions

You need to be able to identify each type.

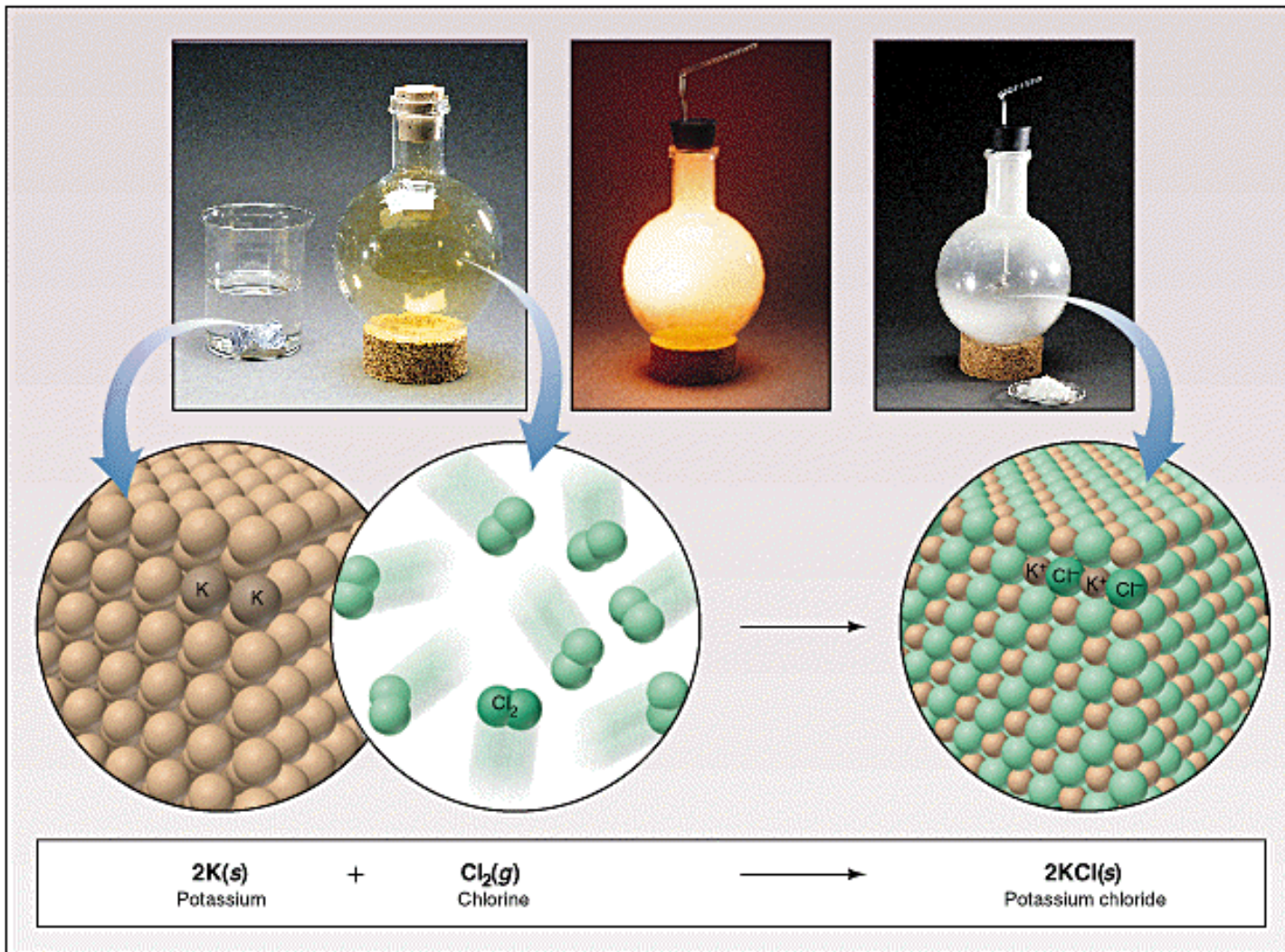
1. Synthesis

Example C + O₂



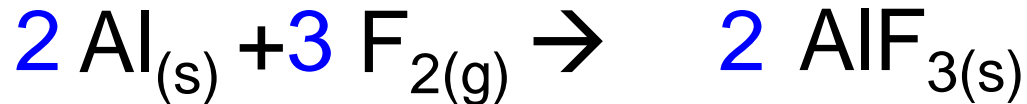
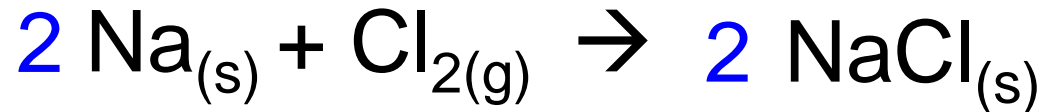
General: $A + B \rightarrow AB$

Ex. Synthesis Reaction



Practice

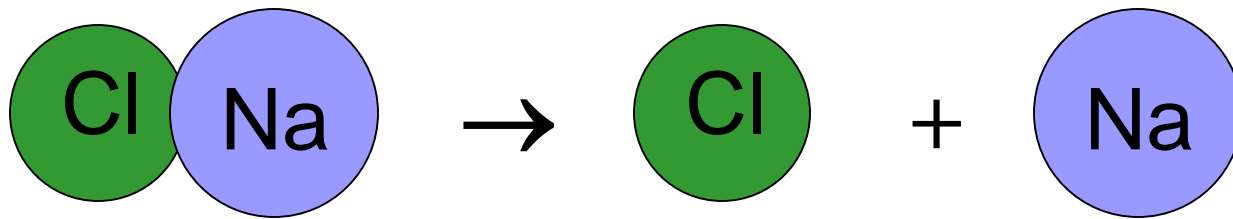
- Predict the products.



- Now, balance them.

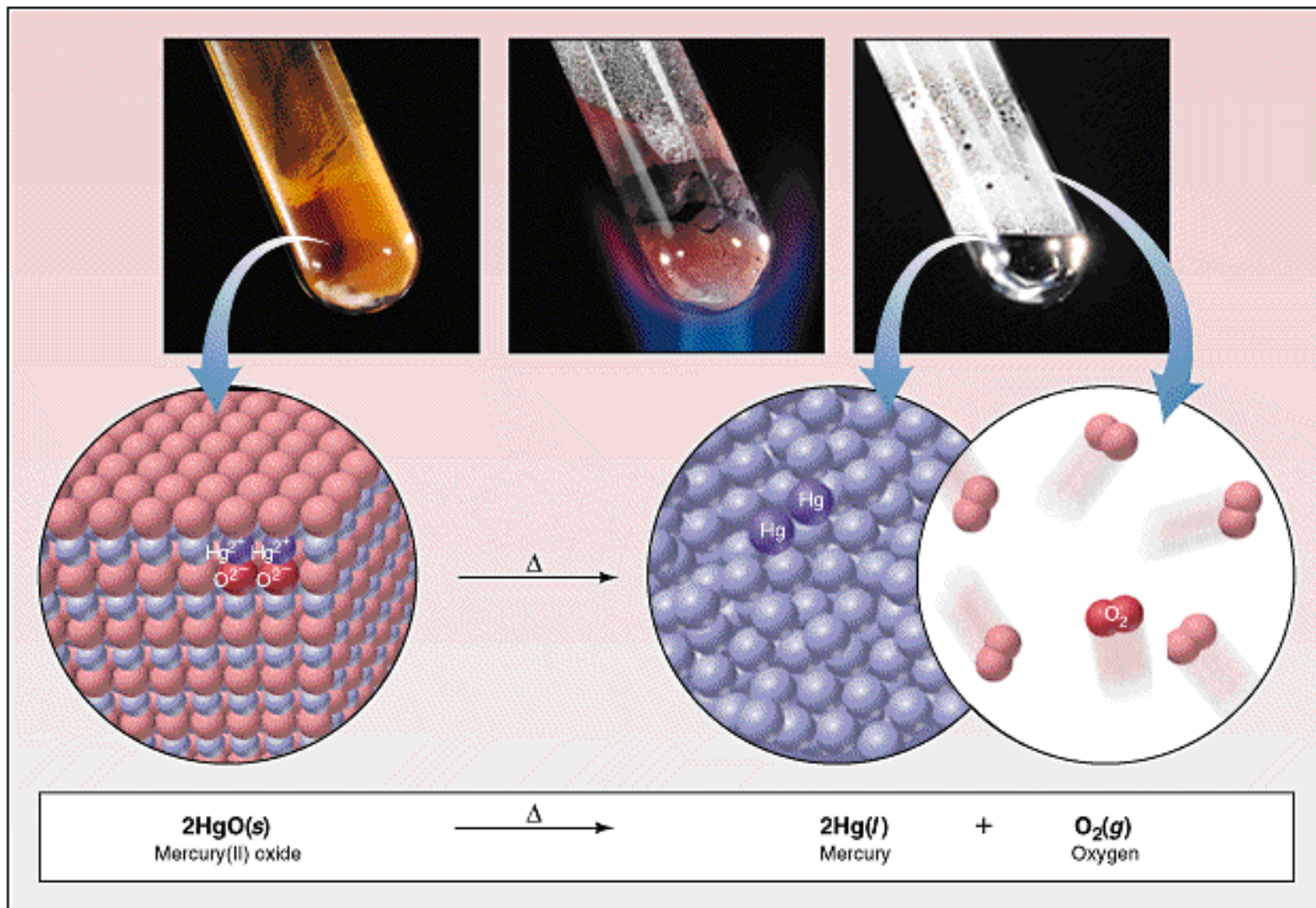
2. Decomposition

Example: NaCl



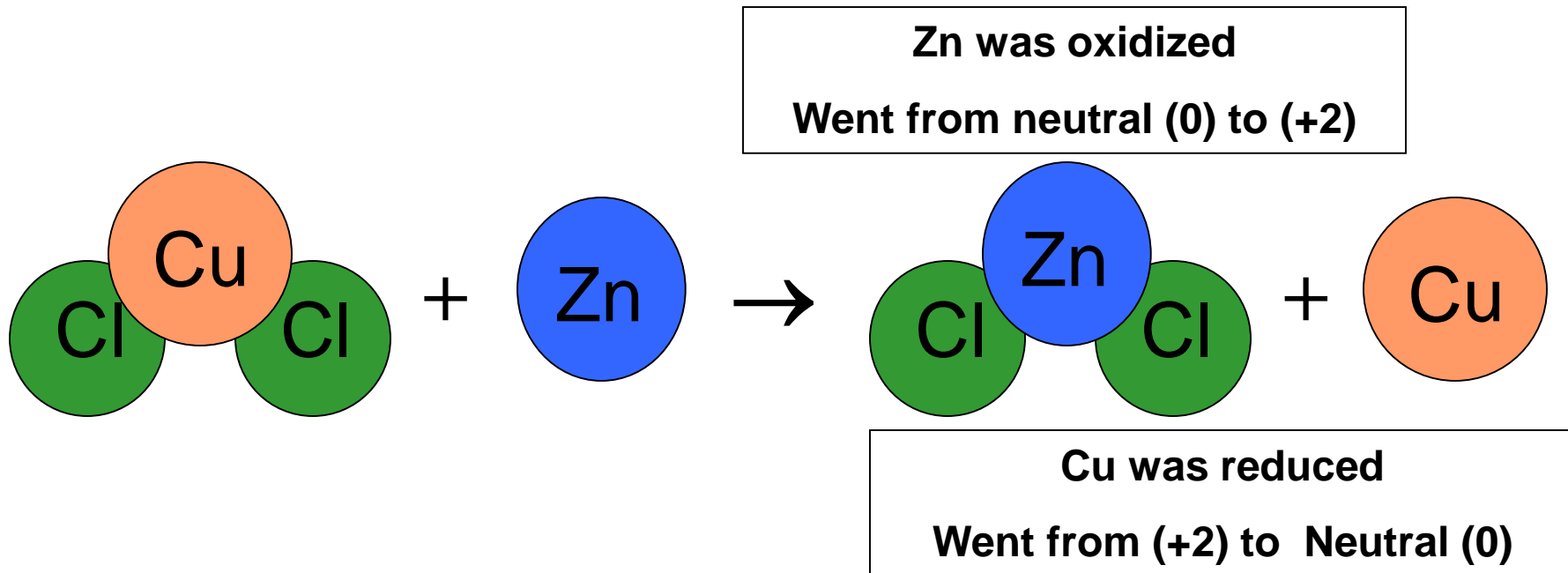
General: $AB \rightarrow A + B$

Ex. Decomposition Reaction



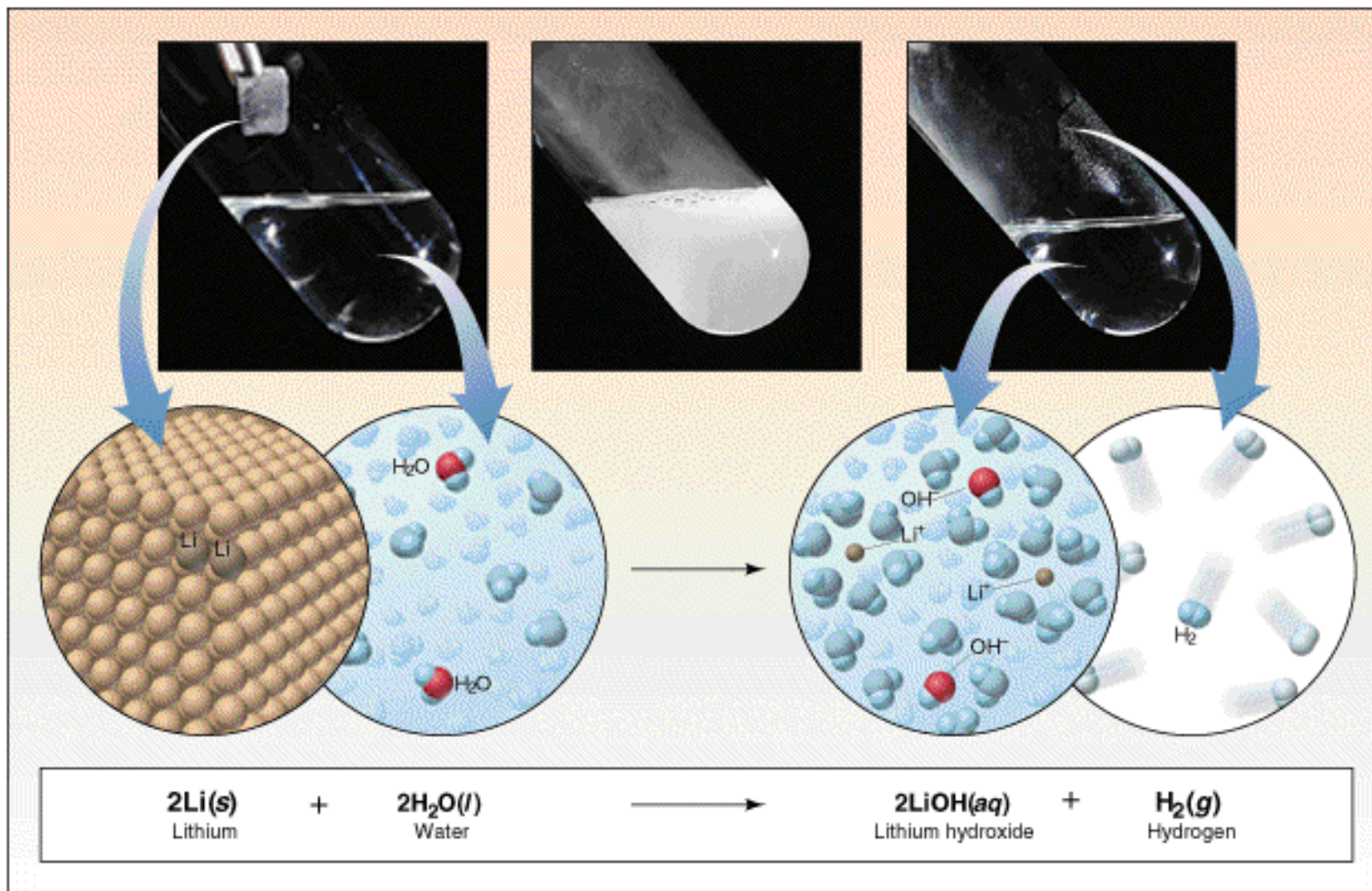
3. Single Displacement

Example: $\text{Zn} + \text{CuCl}_2$



General: $\text{AB} + \text{C} \rightarrow \text{AC} + \text{B}$

Ex. Single Replacement Reaction

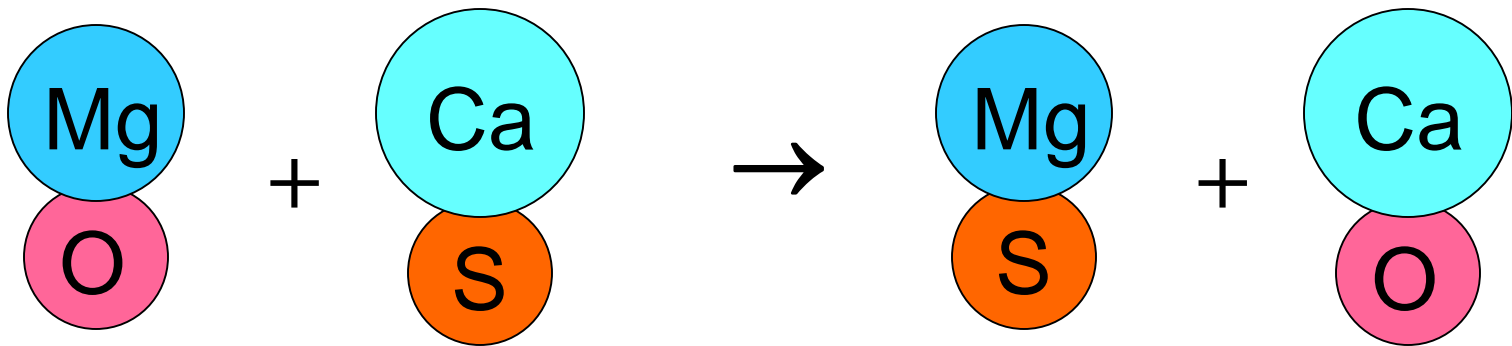


Single Replacement Reactions

- Write and balance the following single replacement reaction equation:
- $\text{Zn}_{(s)} + 2 \text{HCl}_{(aq)} \rightarrow \text{ZnCl}_2 + \text{H}_{2(g)}$
- $2 \text{NaCl}_{(s)} + \text{F}_{2(g)} \rightarrow 2 \text{NaF}_{(s)} + \text{Cl}_{2(g)}$
- $2 \text{Al}_{(s)} + 3 \text{Cu}(\text{NO}_3)_{2(aq)} \rightarrow 3 \text{Cu}_{(s)} + 2 \text{Al}(\text{NO}_3)_{3(aq)}$

4. Double displacement

Example: MgO + CaS

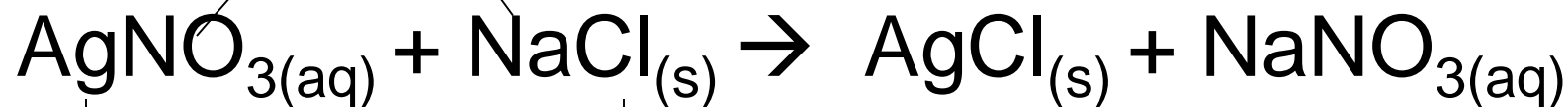


General: $AB + CD \rightarrow AD + CB$

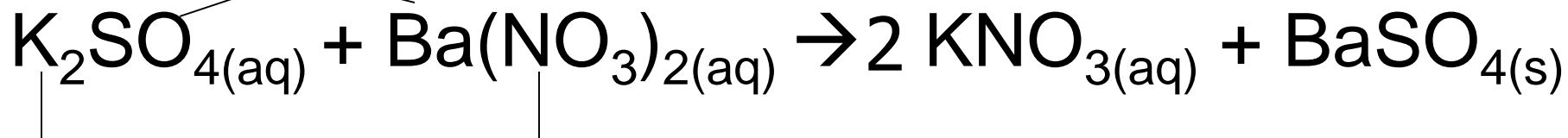
Double Replacement Reactions

- Think about it like “foil”ing in algebra, first and last ions go together + inside ions go together

- Example:

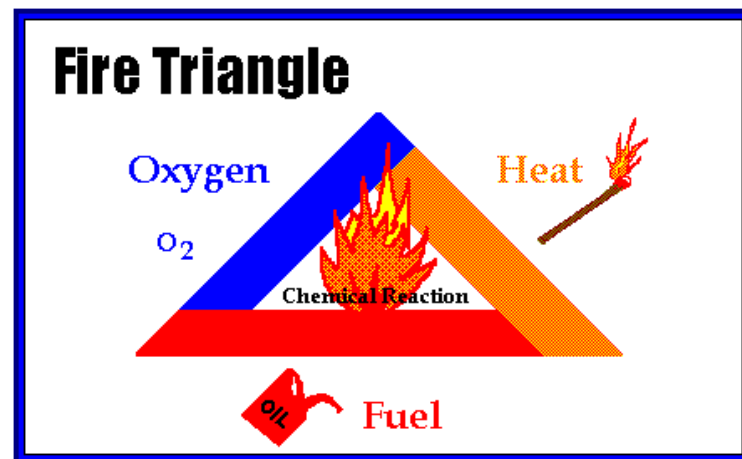


- Another example:



5. Combustion Reactions

- **Combustion reactions** - a hydrocarbon reacts with oxygen gas.
- This is also called burning!!!
- In order to burn something you need the 3 things in the “fire triangle”:
 - 1) Fuel (hydrocarbon)
 - 2) Oxygen
 - 3) Something to ignite the reaction (spark)

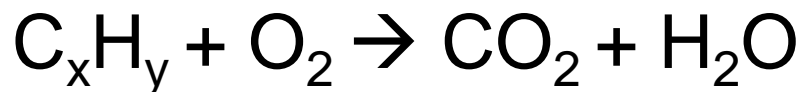




Combustion Reactions



- In general:



- Products are ALWAYS

carbon dioxide and water.

(although incomplete burning does cause some by-products like carbon monoxide)

- Combustion is used to heat homes and run automobiles (octane, as in gasoline, is C_8H_{18})



Mixed Practice

- State the type & predict the products.

