



Lesson 15: Types of Chemical Reactions (Nelson Textbook Pages 222-224)

Learning Goals

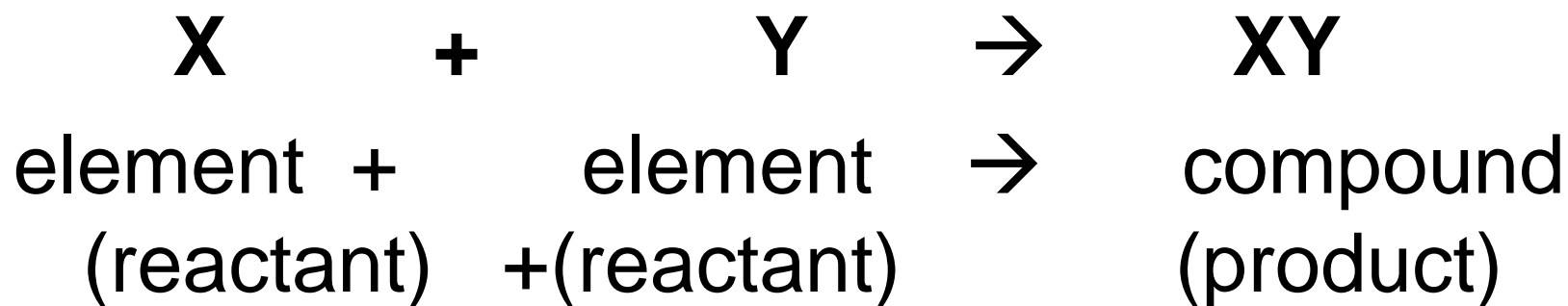
- I can:
- Predict chemical reactions.
- Identify the 4 types of reactions

Types of Chemical Reactions

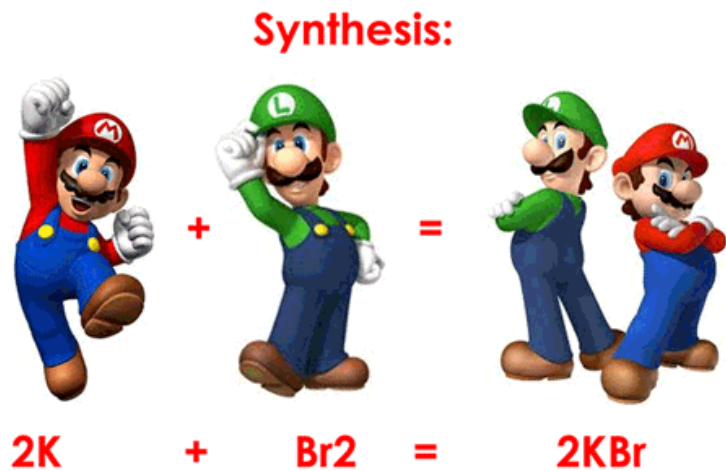
- Reactions are classified into different types **to predict products.**

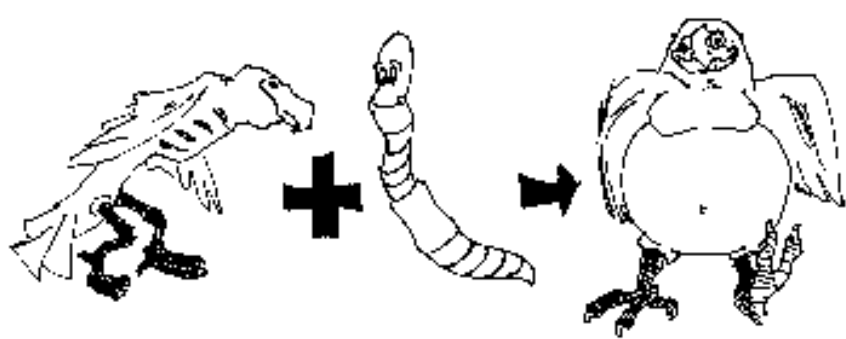
1. Synthesis Reaction

- **“Synthesis”** means a **putting together**.
- **2 or more reactants** combine to make a **new product**.
- General equation:



Synthesis Reaction Example





Skinny bird (reactant) and worm (reactant) combine to make one product – a fat bird.

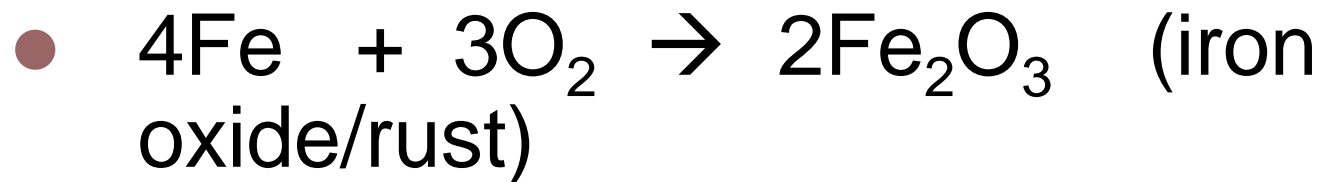
More Examples

- THE BURNING OF CARBON



- RUSTING

(when iron rusts, it combines with oxygen)



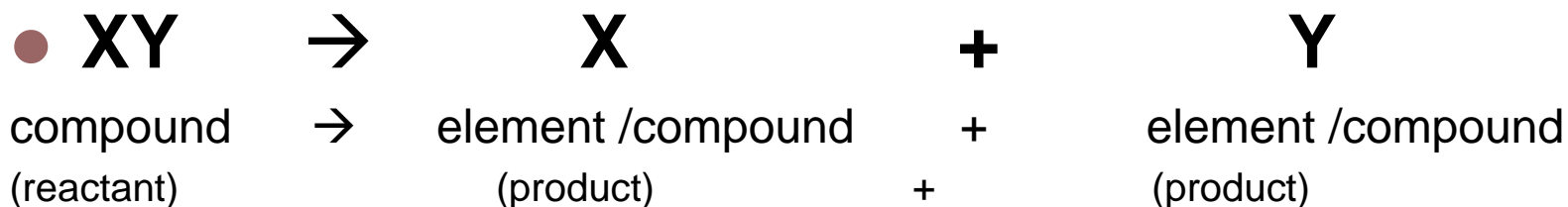
- Burn Mg metal in air (combustion)



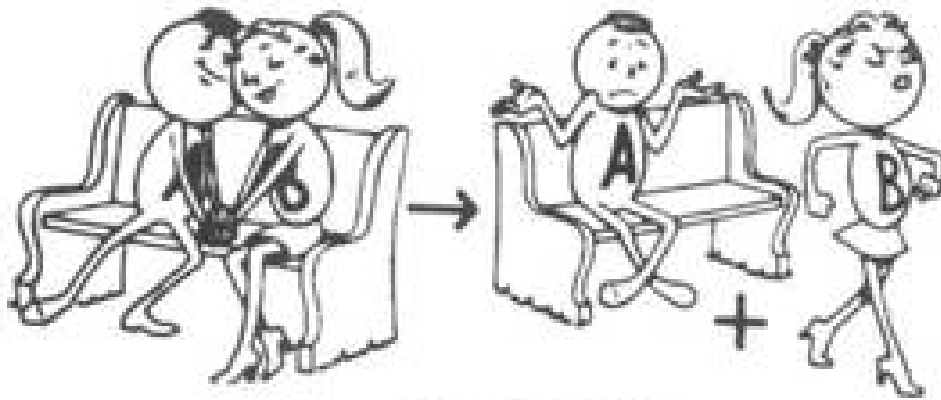
2. Decomposition Reaction

- A compound **breaks down** into 2 or simpler elements or compounds.
- One reactant produces 2 or more products.
- Synthesis and decomposition reactions are opposites.

● General equation:



Decomposition Example



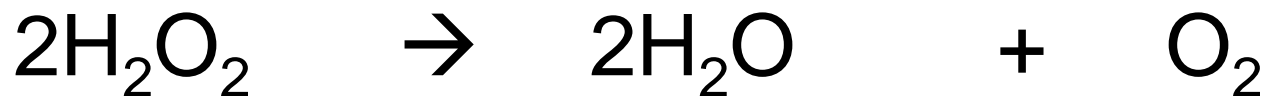
Decomposition.

Examples of Decomposition

- Decomposition of carbonic acid (when the soda “goes flat”)

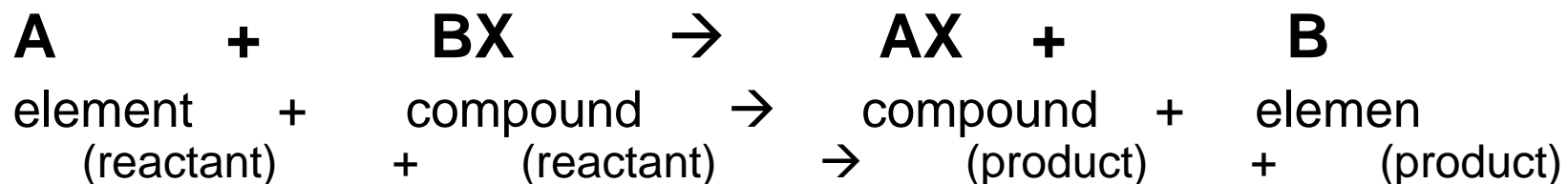


- Decomposition of **sodium bicarbonate** (CO₂ gas makes the cookies “rise”.)
- **Hydrogen peroxide** decomposes into water and oxygen

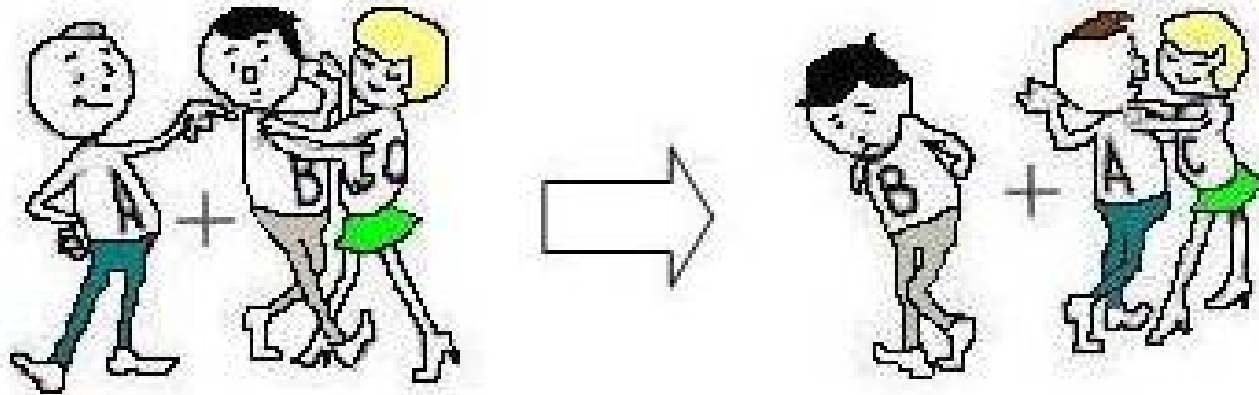


3. Single Displacement

- 1 element **takes place of** another element in a compound.
- **One reactant** is always an **element**.
- The **other reactant** will be a **compound**.
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- General equation:



Visualize Single Displacement



Examples of Single Displacement

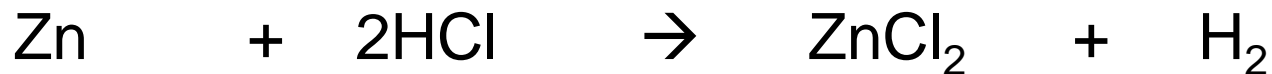
- **Sodium** reacts with **water** to produce **hydrogen gas**.



- **Magnesium** reacts with **hydrochloric acid** to produce **hydrogen gas**.

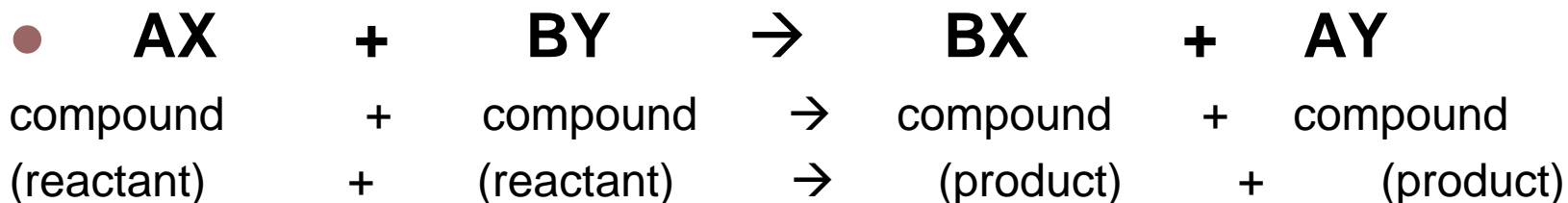


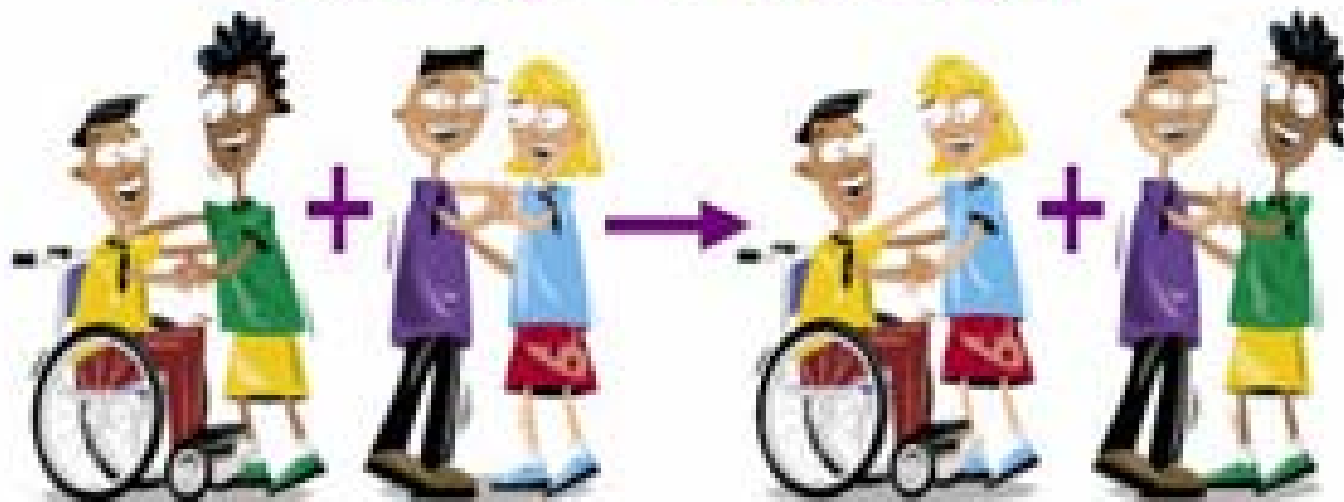
- **Zinc** solid in **hydrochloric acid**



4. Double Displacement Reaction

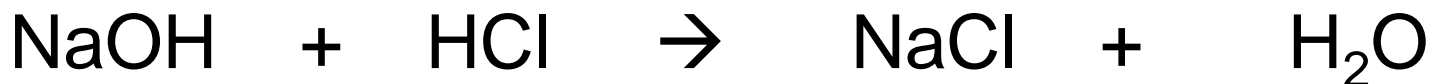
- **Elements** in different compound **exchange places**, forming **two new compounds**.
- **Both reactants** are compounds, each with a **positive ion** and a **negative ion**.
- **Usually form a precipitate (solid)**.
- General equation:





Examples of Double Displacement

- Reaction of **sodium hydroxide** (base) with **hydrochloric acid** (**neutralization**)
- Acids react with bases to produce **salt** and **water**.



- Mixing **lead (II) nitrate solution** and **potassium iodide solution**

