

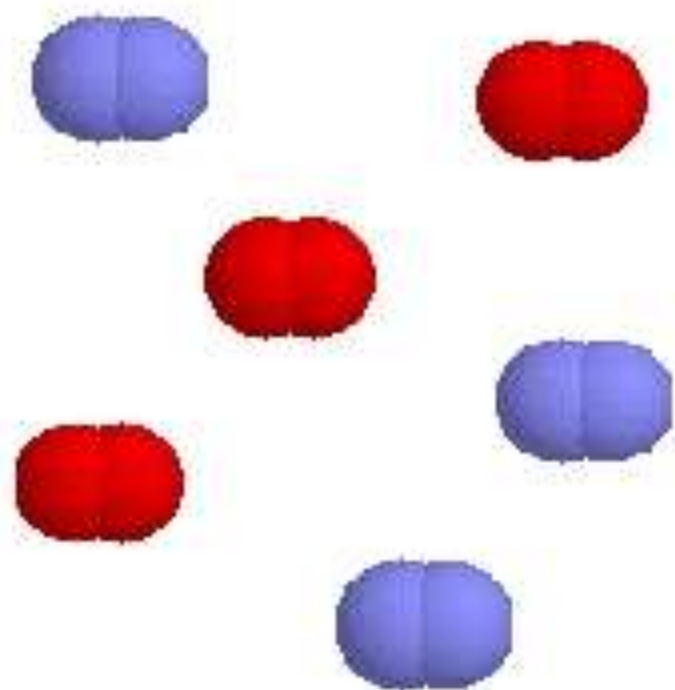
Chemical Reaction



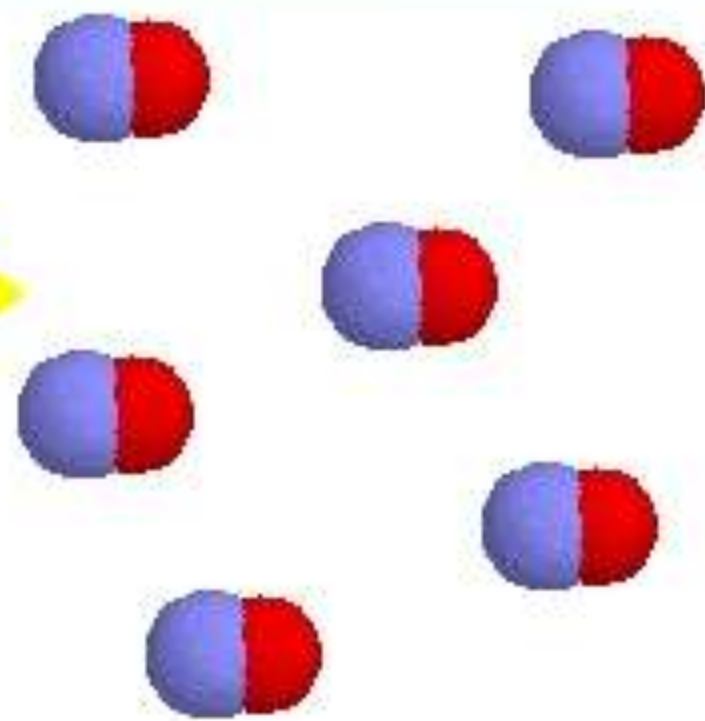


Combination Reactions

Reactants



Product



Symbols

- Symbols are used to show the state of the matter in the chemical reaction
 - (c) stands for crystal,
 - (g) stands for gas,
 - (l) stands for liquid, &
 - (aq) means that is dissolved in water.
 - Example: $\text{AgNO}_3 (\text{aq}) + \text{NaCl} (\text{aq}) \rightarrow \text{AgCl} (\text{c}) + \text{NaNO}_3 (\text{aq})$

Precipitate

- The crystal falls out of the solution in this reaction
- This process is called precipitate
- Sometimes gases are released from a reaction



Balancing chemical equations

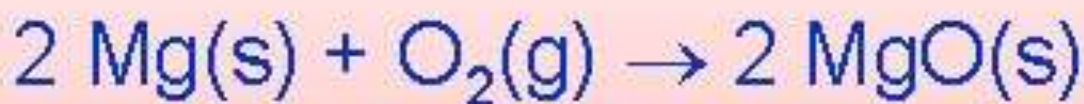
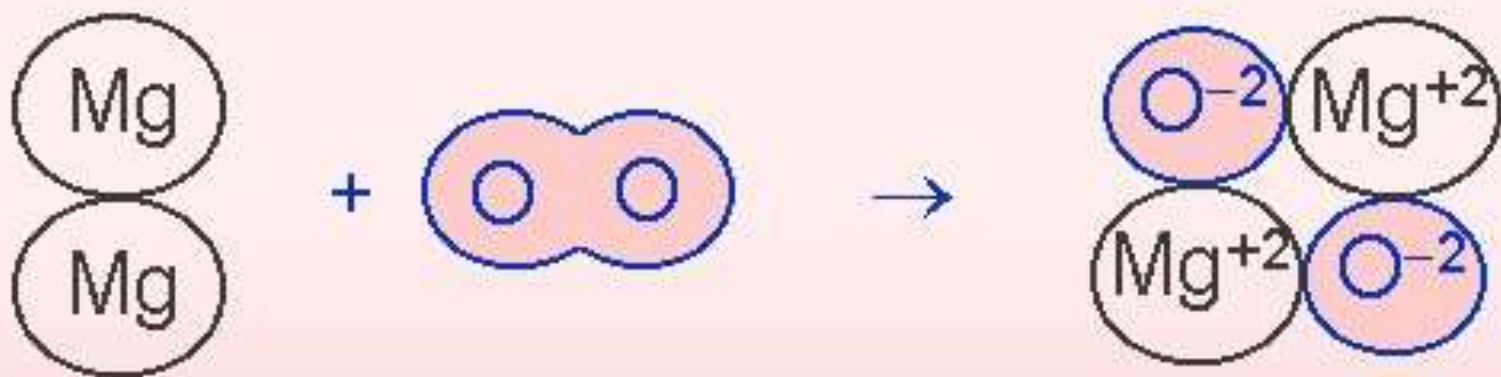
- Write the word equation
Hydrogen + Oxygen Yields Water
- Then write the symbols and balanced the formulas for the substances in the equation

Balancing Chemical Equations

- Put the reactants on the left and the products on the right
- Check the numbers of atoms of each element on each side of the equation to make sure they balance
- Example $\text{Mg} + \text{O}_2 \rightarrow \text{MgO}$
- If atoms do not balance then use coefficients to balance the equation
 $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$

Balancing Chemical Equations

A balanced chemical equation has the same type and number of atoms in the reactants as in the products.

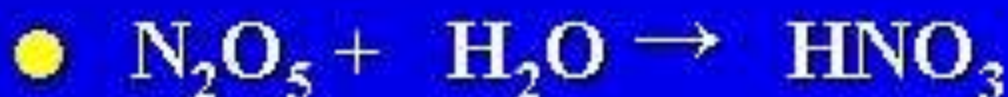


Physical states



Balancing chemical equations

● Balance the following equations:



06m02vd1



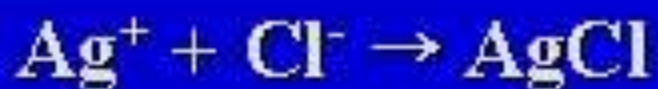


Balanced Equations



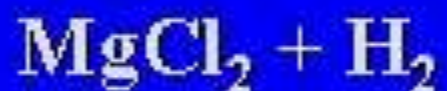


Precipitate Formation





Gas Bubbles



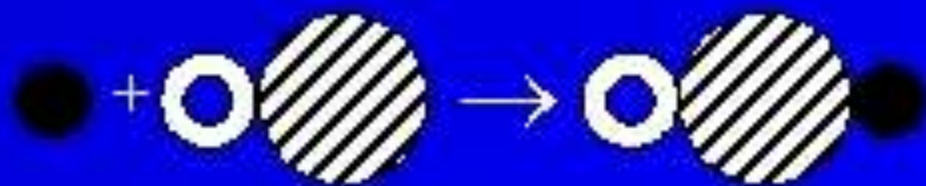
Types of reactions

- Synthesis reaction is putting things together
- Synthesis is sometimes called a composition or combination reaction





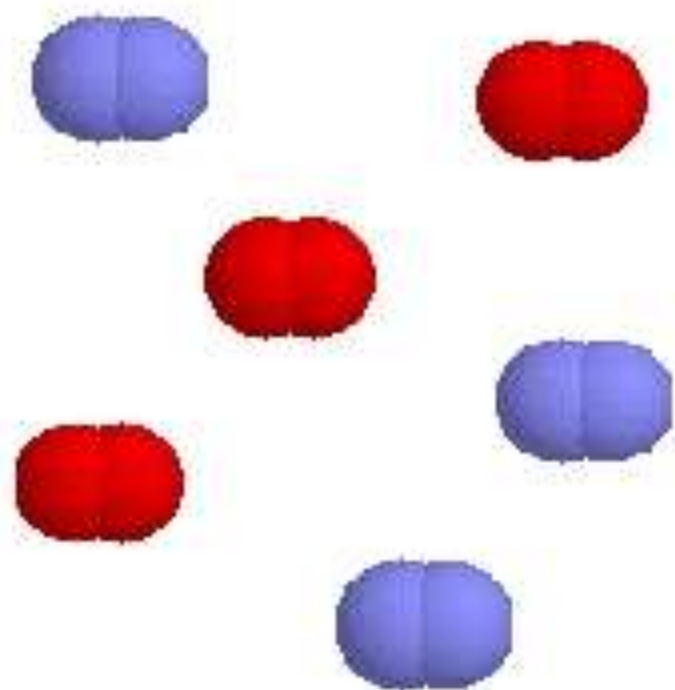
Combination



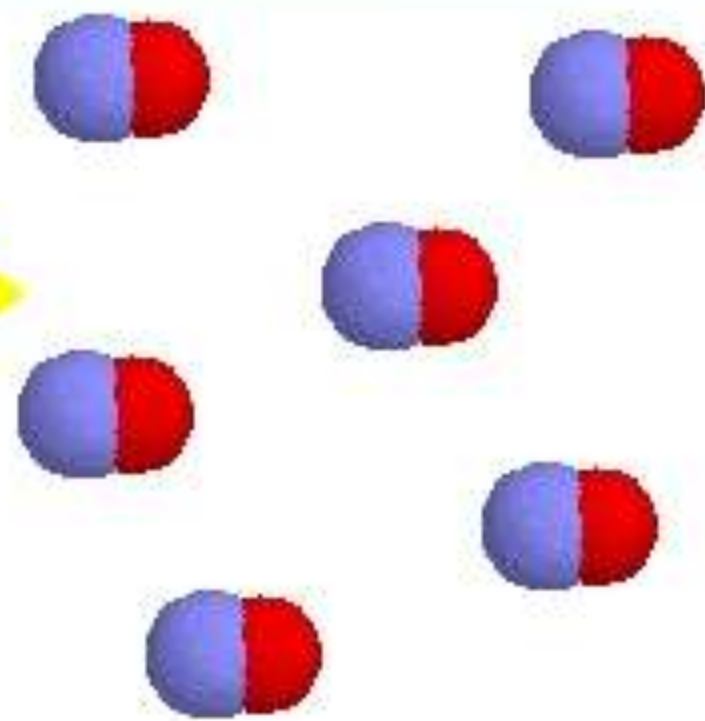


Combination Reactions

Reactants



Product



Types of Reactions

- Decomposition is a reaction that causes things to break down





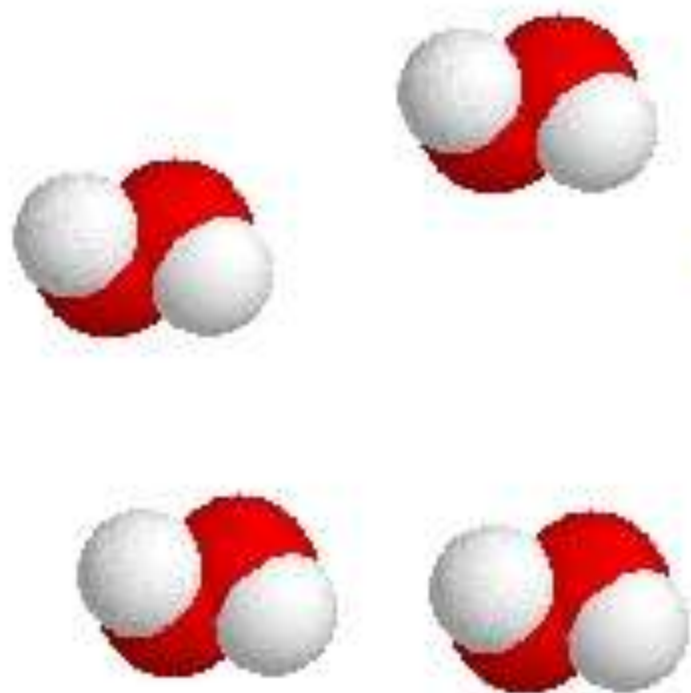
Decomposition



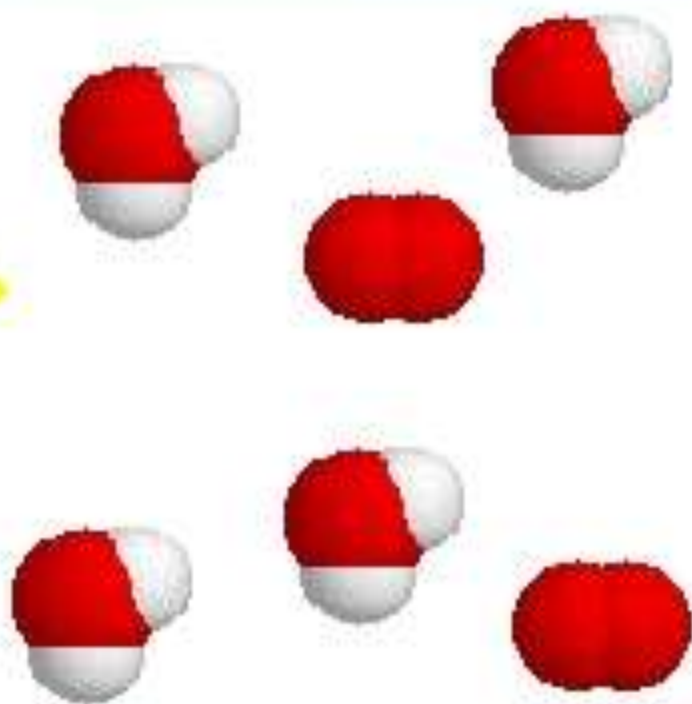


Decomposition Reactions

Reactant



Products

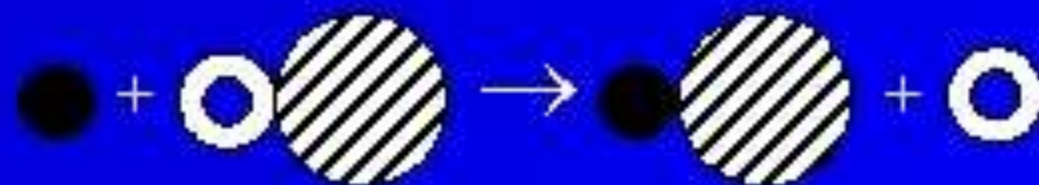


Types of reactions

- Displacement reactions are when one element will replace another element
 - Single displacement
 $\text{BeF}_2 + \text{Mg} \rightarrow \text{MgF}_2 + \text{Be}$
 - Double Displacement
 $\text{AgNO}_2 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$
- Electrolysis is the process of running an electrical current through a brine solution to cause them to break down



Single Displacement



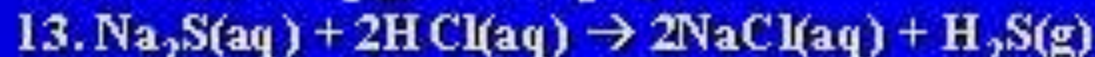
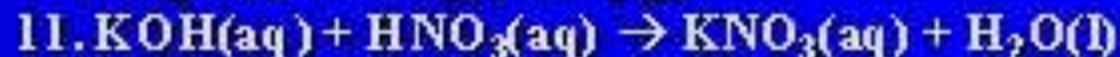
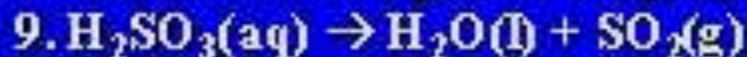
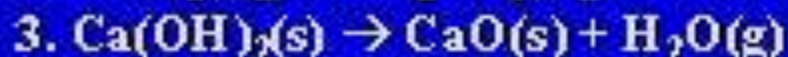


Double Displacement





Classify the following reactions, based on the changes happening at an atomic/molecular level.



The law of conservation of mass

- Applies to regular chemical reactions.
 - The basics of the law state that matter is not created or destroyed
 - This is why it is necessary to have the right number and kinds of atoms on each side of the equation. The mass must be the same.

Energy of Reactions

- Exothermic Reactions give off energy
- Endothermic reactions require energy to take place
- The Rate of the reaction can be affected
 - Inhibitors - slow down the reaction
 - Preservatives
- Catalyst speed up a reaction
 - Enzymes



Temperature Change



Predicting Reactions

- When two salts react it will be a double displacement
- When a salt reacts with another single element it is usually a single displacement
- When an acid and a base react they produce salt and water
- When a metal oxide is put in water it forms a hydroxide
- When a highly reactive metal is put in water it forms a hydroxide and hydrogen gas
- When a nonmetal oxide is put in water it forms an acid
- When a hydrocarbon burns it produces carbon dioxide and water