Chemical Equations

A chemical equation is a representation of a chemical reaction. It shows the reactants, products, and the direction of the reaction.

Types of Chemical Equations

- **Combination reaction:** A reaction in which two or more substances combine to form a single product.
- **Decomposition reaction:** A reaction in which a single substance breaks down into two or more products.
- **Single-replacement reaction:** A reaction in which one element replaces another element in a compound.
- **Double-replacement reaction:** A reaction in which two compounds exchange ions to form two new compounds.

Balancing Chemical Equations

A chemical equation must be balanced so that the number of atoms of each element is the same on both sides of the equation. This can be done by adding coefficients to the reactants and products.

Example

Consider the following unbalanced chemical equation:

$2H2 + O2 \rightarrow H2O$

To balance this equation, we need to add a coefficient of 2 to the H2O molecule.

$2H2 + O2 \rightarrow 2H2O$

This equation is now balanced because there are two atoms of hydrogen on both sides of the equation and two atoms of oxygen on both sides of the equation.

Summary

Chemical equations are a useful way to represent chemical reactions. They show the reactants, products, and the direction of the reaction. Chemical equations can be balanced to ensure that the number of atoms of each element is the same on both sides of the equation.