Chapter 4: CHEMICAL REACTIONS

Reactants: Zn + I₂ → Product: ZnI₂

Chemical Equations

Depict the kind of reactants and products and their relative amounts in a reaction.

4 Al(s) + 3 O₂(g) → 2 Al₂O₃(s)

The numbers in front are called stoichiometric coefficients.

The letters (s), (g), and (l) are the physical states of compounds (solid, liquid or gas).

Because the same atoms are present in a reaction at the beginning and at the end, the amount of matter in a system does not change.

This is the Law of the Conservation of Matter.
Because of the principle of the conservation of matter, an equation must be balanced. It must have the same number of atoms of the same kind on both sides.

Chemical Equations

\[ 2\text{Al(s)} + 3\text{Br}_2(\text{liq}) \rightarrow \text{Al}_2\text{Br}_6(s) \]

Balancing Equations

\[ 1\text{C}_3\text{H}_8(g) + 5\text{O}_2(g) \rightarrow 3\text{CO}_2(g) + 4\text{H}_2\text{O}(g) \]

\[ 2\text{B}_4\text{H}_{10}(g) + 11\text{O}_2(g) \rightarrow 4\text{B}_2\text{O}_3(g) + 10\text{H}_2\text{O}(g) \]

Feb. 17, 2006