

Redox reactions- short for oxidation-reduction reactions; chemical reaction which involves a partial or complete transfer of electrons from one reactant to another. The movement of electrons releases energy when they go to a more electronegative atom.

oxidation- loss of electron **reduction**- gain of electron

General form of redox rxn:



X is being oxidized (lost electron); it is a reducing agent because it reduces Y

Y is being reduced (gained electron); it is the oxidizing agent because it oxidizes X

Example: formation of NaCl



Na is oxidized (loses electron; 0 to +1) and Cl is reduced (gains electron; 0 to -1)

Example: combustion of methane (oxygen is very electronegative)



CH₄ is oxidized (combined with oxygen), O₂ is reduced (0 to -2)

Energy released in the reaction is from the movement of electrons. The electrons are held tightly by more electronegative atoms.

Optional

Nicotinamide adenine dinucleotide (NAD⁺) - dinucleotide; fxn-coenzyme in the redox rxns of metabolism.

NAD⁺ is the oxidizing agent for glucose; traps energy-rich electrons from glucose or food.

Forms: NAD⁺ (oxidized), NADH (reduced); a single NADH molecule can produce 3 ATP