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A **chemical reaction** is a process that leads to the **chemical transformation** of one set of **chemical substances** to another.^[1] Classically, **chemical** reactions encompass changes that only involve the positions of **electrons** in the forming and breaking of **chemical bonds** between **atoms**, with no change to the **nuclei** (no change to the elements present), and can often be described by a **chemical equation**. **Nuclear chemistry** is a sub-discipline of **chemistry** that involves the chemical reactions of **unstable** and **radioactive elements** where both electronic and nuclear changes can occur.

The substance (or substances) initially involved in a chemical reaction are called **reactants or reagents**. Chemical reactions are usually characterized by a **chemical change**, and they yield one or more **products**, which usually have properties different from the reactants. Reactions often consist of a sequence of individual sub-steps, the so-called **elementary reactions**, and the information on the precise course of action is part of the **reaction mechanism**. Chemical reactions are described with **chemical equations**, which symbolically present the starting materials, end products, and sometimes intermediate products and reaction conditions.

Chemical reactions happen at a characteristic **reaction rate** at a given temperature and chemical concentration. Typically, reaction rates increase with increasing temperature because there is more **thermal energy** available to reach the activation energy necessary for breaking bonds between atoms.

Reactions may proceed in the forward or reverse direction until they go to completion or reach **equilibrium**. Reactions that proceed in the forward direction to approach equilibrium are often described as **spontaneous**, requiring no input of free energy to go forward. Non-spontaneous reactions require input of free energy to go forward (examples include charging a battery by applying an external electrical power source, or photosynthesis driven by absorption of **electromagnetic radiation** in the form of sunlight).

A reaction may be classified as **redox** in which **oxidation** and **reduction** occur or nonredox in which there is no oxidation and reduction occurring. Most simple redox reactions may be classified as combination, decomposition, or single displacement reactions.

Different chemical reactions are used during **chemical synthesis** in order to obtain a desired product. In **biochemistry**, a consecutive series of chemical reactions (where the product of one reaction is the reactant of the next reaction) form **metabolic pathways**. These reactions are often **catalyzed** by protein **enzymes**. Enzymes increase the rates of biochemical reactions, so that **metabolic** syntheses and decompositions impossible under ordinary conditions can occur at the temperatures and concentrations present within a **cell**.

The general concept of a chemical reaction has been extended to reactions between entities smaller than atoms, including [nuclear reactions](#), [radioactive decays](#), and reactions between [elementary particles](#), as described by [quantum field theory](#).

1. Give a title to the text.
2. What are the main ideas of the text ?
3. Write a summary of this text in ten lines