

## CHAPTER OVERVIEW

### 5: Chemical Kinetics, Reaction Mechanisms, and Chemical Equilibrium

**Chemical kinetics** is the study of how fast chemical reactions occur and of the factors that affect these rates. The study of reaction rates is closely related to the study of **reaction mechanisms**, where a reaction mechanism is a theory that explains how a reaction occurs.

- 5.1: Chemical Kinetics
- 5.2: Reaction Rates and Rate Laws
- 5.3: Simultaneous Processes
- 5.4: The Effect of Temperature on Reaction Rates
- 5.5: Other Factors that Affect Reaction Rates
- 5.6: Mechanisms and Elementary Processes
- 5.7: Rate Laws for Elementary Processes
- 5.8: Experimental Determination of Rate Laws
- 5.9: First-order Rate Processes
- 5.10: Rate Laws by the Study of Initial Rates
- 5.11: Rate Laws from Experiments in a Continuous Stirred Tank Reactor
- 5.12: Predicting Rate Laws from Proposed Mechanisms
- 5.13: The Michaelis-Menten Mechanism for Enzyme-catalyzed Reactions
- 5.14: The Lindemann-Hinshelwood Mechanism for First-order Decay
- 5.15: Why Unimolecular Reactions are First Order
- 5.16: The Mechanism of the Base Hydrolysis of  $\text{Co}(\text{NH}_3)_5\text{X}^{n+}$
- 5.17: Chemical Equilibrium as the Equality of Rates for Opposing Reactions
- 5.18: The Principle of Microscopic Reversibility
- 5.19: Microscopic Reversibility and the Second Law
- 5.20: Problems

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