A Libretexts Textmap organized around McQuarrie and Simon's textbook

Physical Chemistry: A Molecular Approach

- Front Matter

- 1: The Dawn of the Quantum Theory

- 2: The Classical Wave Equation

- 3: The Schrödinger Equation and a Particle in a Box
4: Postulates and Principles of Quantum Mechanics

![Diagram of two masses connected by a bond length R]

- 5: The Harmonic Oscillator and the Rigid Rotor

![Diagram of a molecule with bond lengths and angles]

- 6: The Hydrogen Atom

\[
E^{(1)}_n = \langle \phi_n | H_1 | \phi_n \rangle \\
C^{(1)}_{nk} = \frac{\langle \phi_k | H_1 | \phi_n \rangle}{E^{(0)}_n - E^{(0)}_k} \\
E^{(2)}_n = \sum_{k \neq n} \frac{\langle \phi_k | H_1 | \phi_n \rangle^2}{E^{(0)}_n - E^{(0)}_k}
\]

- 7: Approximation Methods
8: Multielectron Atoms

9: Chemical Bonding in Diatomic Molecules

10: Bonding in Polyatomic Molecules

11: Computational Quantum Chemistry
12: Group Theory - The Exploitation of Symmetry

• 13: Molecular Spectroscopy

• 14: Nuclear Magnetic Resonance Spectroscopy

• 15: Lasers, Laser Spectroscopy, and Photochemistry
16: The Properties of Gases

• 17: Boltzmann Factor and Partition Functions

\[ Z = \sum_i e^{-\beta E_i} \]

• 18: Partition Functions and Ideal Gases

• 19: The First Law of Thermodynamics
20: Entropy and The Second Law of Thermodynamics

\[ S \]

\[ X_1 \quad X_2 \]

\[ 0 \quad T \]

- 21: Entropy and the Third Law of Thermodynamics

- 22: Helmholtz and Gibbs Energies

- 23: Phase Equilibria
24: Solutions I - Liquid-Liquid Solutions

25: Solutions II - Solid-Liquid Solutions

• 26: Chemical Equilibrium

27: The Kinetic Theory of Gases
28: Chemical Kinetics I - Rate Laws

29: Chemical Kinetics II - Reaction Mechanisms

30: Gas-Phase Reaction Dynamics

31: Solids and Surface Chemistry
$e^{i\pi} + 1 = 0$

32: Math Chapters

- Back Matter