A Libretexs 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

\[ R = \text{bond length} \]

\[ r_1 \quad \text{C} \quad r_2 \]

- 5: The Harmonic Oscillator and the Rigid Rotor

\[ 1.7 \times 10^{-10} \, \text{Å} \]

\[ 1.1 \, \text{Å} \]

- 6: The Hydrogen Atom

\[ E_n^{(1)} = \langle \phi_n | H_1 | \phi_n \rangle \]

\[ c_{nk}^{(1)} = \frac{\langle \phi_k | H_1 | \phi_n \rangle}{E_n^{(0)} - E_k^{(0)}} \]

\[ E_n^{(2)} = \sum_{k \neq n} \frac{|\langle \phi_k | H_1 | \phi_n \rangle|^2}{E_n^{(0)} - E_k^{(0)}} \]

- 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

21: Entropy & 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
$e^{i\pi} + 1 = 0$