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

R = bond length

$m_1$ \hspace{1cm} C \hspace{1cm} m_2

r_1 \hspace{1cm} r_2

5: The Harmonic Oscillator and the Rigid Rotor

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
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
$e^{i\pi} + 1 = 0$