Exam 2 Review Topics

11th April 2008

I. Review: Exam 2 Chem444 Spring 2008
Chapters Engel and Reid, inclusive.

I. Kinetics

- Enzyme Kinetics
- Chain Reactions
- Surface Kinetics / Surface Reactions
- Chain Polymerizations

II. Quantum Mechanics

- Mathematics of function space (orthogonality, normalization of function)
- Schrodinger Wave Equation
- Quantized energy, wave vector, frequency
- Fundamental Postulates
  - Meaning of ψ
  - Probability Density
  - Expectation Values
  - Measurements/Operators/Observables and relationships between them
  - Collapse of the wavefunction

III. Particle in a Box

- Wavefunctions
- Eigenvalues

- Degeneracy
- Symmetry

IV. Harmonic Oscillator

- Wavefunctions (Hermite polynomials)
- Eigenvalues
- behavior of quantum oscillator relative to classical oscillator
- orthogonality of eigenfuntions

V. Rigid Rotor

- Wavefunctions (spherical harmonics)
- eigenvalues of Hamiltonian
- Angular momentum operator
- Eigenvalues of L^2 and L_z
- Commutativity relations between H, L, L^2

VI. Hydrogen Atom

- 1. Wavefunctions
- 2. Eigenvalues
- 3, Connection to atomic spectra