

Review Sheet for First Exam

Topics We Covered

- periodic table of the elements: structure and naming conventions
- introduction to types of bonding: covalent, ionic, and metallic
- representing and naming compounds
- wave and particle theory of light
- interaction of light and matter: atomic spectra and photoelectric effect
- Coulomb's law: energy of electron in atom, ionization energy
- Bohr model of the atom: shells and subshells
- photoelectron spectroscopy
- quantum (wave) model of the atom: quantum numbers and atomic orbitals
- electrons in atoms: core, valence, electron configurations, electron spin
- Madelung's Rule (Aufbau Principle) and Slater's Rules
- periodic properties of elements: atomic radii, ionic radii, ionization energies, average valence electron energies, electron affinities

Equations Provided to You

- $c = \lambda\nu$
- $E = h\nu = \frac{hc}{\lambda}$
- $\frac{1}{\lambda} = (1.09737 \times 10^{-2} \text{ nm}^{-1}) \times \left\{ \frac{1}{n_1^2} - \frac{1}{n_2^2} \right\}$
- $KE = h\nu - BE$
- $E \propto \frac{q_1 \times q_2}{d}$
- $IE \propto \frac{Z \times e}{r}$
- $Z_{\text{eff}} = Z - S$
- $AVEE = \frac{x \times IE_s + y \times IE_p + z \times IE_d}{x + y + z}$ (valence shell electrons only)

Constants Provided to You

- $c = 2.998 \times 10^8 \text{ m/s}$
- $h = 6.626 \times 10^{-34} \text{ Js}$
- $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$

Other Information Provided to You

- periodic table
- Slater's rules
- ionization energies, electron affinities, atomic and ionic radii, AVEE values as needed