

## Review Sheet for First Exam

### Topics 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

$$c = \lambda\nu$$

$$E = h\nu$$

$$KE = h\nu - W = h\nu - BE$$

$$\frac{1}{\lambda} = 1.09737 \times 10^{-2} \text{ nm} \left( \frac{1}{n_1^2} - \frac{1}{n_2^2} \right)$$

$$V \propto \frac{Q_+ Q_-}{d}$$

$$AVEE = \frac{xIE_s + yIE_p + zIE_d}{x + y + z} \text{ (valence shell electrons only)}$$

### Constants Provided to You

$$c = 2.998 \times 10^8 \text{ m/s}$$

$$h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$$

$$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$$

### Other Information Provided to You

periodic table

Slater's rules

ionization energies, electron affinities, atomic and ionic radii, AVEE values as needed

*Note: The topics we cover in Chem 130, and their order and emphasis, vary slightly from semester-to-semester. As well, no single exam can touch upon all topics covered. For these reasons, you should view the practice exam available on the course web site as providing general insight into how I construct exams and as providing an opportunity to test your understanding on some of the course's topics. Although exams this semester are similar in format and style to these practice exams, they will, of course, reflect our work and experience as the semester unfolds.*