Supplement for First Exam

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

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

Slater's Rules (for elements in first five rows of periodic table)

1. write the electron configuration in groups using this order

$$(1s) \quad (2s, 2p) \quad (3s, 3p) \quad (3d) \quad (4s, 4p) \quad (4d) \quad (5s, 5p)$$

2. identify the group in which the electron of interest lies and ignore all electrons to the right of this group
3. if the electron of interest is an s or p electron, then
    - each additional electron in its group (ns, np) contributes 0.35 to S
    - each electron in the $n-1$ shell contributes 0.85 to S
    - each electron further to the left contributes 1.00 to S
4. if the electron of interest is a d electron, then
    - each additional electron in its (nd) group contributes 0.35 to S
    - each electron further to the left contributes 1.00 to S