

Review Sheet for Third Exam

Topics Covered

- solid-state structure: unit cells, lattice points, coordination numbers
- simple cubic, body-centered cubic, face-centered cubic, closest packing
- cubic holes, tetrahedral holes, octahedral holes, radius-ratio rule
- acid-base reactions: strong vs. weak, K_a vs. K_b , conjugate pairs
- influence of structure on acid-base reactivity
- predicting acid-base reactivity
- oxidizing and reducing agents
- oxidation states
- predicting oxidation-reduction reactivity
- metal-ligand complexes and coordination compounds
- isomers and naming metal-ligand complexes
- bonding models for metal-ligand complexes

Equations That Will be Provided to You

- $c = \lambda\nu$ $E = h\nu$ $KE = h\nu - BE$ $\frac{1}{\lambda} = 1.09737 \times 10^{-2} \text{ nm} \left(\frac{1}{n_1^2} - \frac{1}{n_2^2} \right)$
- $V = \frac{kq_1q_2}{d}$
- $FC_a = V_a - N_a - \frac{B_a}{2}$
- $\ddot{a}_a = V_a - N_a - B_a \left(\frac{EN_a}{EN_a + EN_b} \right)$
- $OX_a = V_a - N_a - B_a \times (0 \text{ if least EN}; 1 \text{ if most EN})$
- $K_a \times K_b = K_w$ for conjugate acid/base pair

Constants and Other Information That Will be Provided to You

- $c = 2.998 \times 10^8 \text{ m/s}$
- $h = 6.626 \times 10^{-34} \text{ Js}$
- $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$
- Radius-Ratio table
- Equilibrium constants and oxidation/reduction potentials

Note – some of the arguments used in this section are based on Lewis structures. Be sure to review this topic and to practice so that you can draw them fairly quickly.