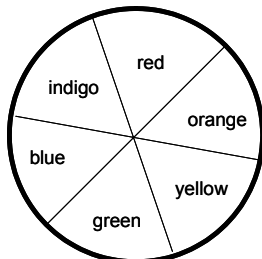


# Exam 2 Topics (Chem 1B)

## • Spectroscopy (UV/Vis)

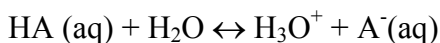
1. What does it mean if you see an object at a certain color?
2. Use of a color wheel. (Also be able to make.)



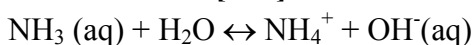
3. What causes a compound to have a certain absorbance?
4. Beer's Law
  - $A = \epsilon bc$
5. Calibration cruves

## • Chapter 14 – Acid & Bases

6. Definition of an Acid & Base
  - Arrhenius
  - Bronsted – Lowry
  - Lewis
7. Acid and Base Dissociation Constants



- $$K_a = \frac{[\text{H}^+][\text{A}^-]}{[\text{HA}]}$$



- $$K_b = \frac{[\text{NH}_4^+][\text{OH}^-]}{[\text{NH}_3]}$$

8. What does it mean to have a “high”  $K_a$  or  $K_b$  value?
9. Autoionization of water
  - $K_w = [\text{H}^+][\text{OH}^-] = 1.0 \times 10^{-14}$
10. Relationship between  $K_a$ ,  $K_b$ , and  $K_w$ 
  - $K_a \times K_b = K_w$
11. pH & pOH
  - $\text{pH} = -\log [\text{H}^+]$
  - $\text{pOH} = -\log [\text{OH}^-]$
  - $\text{pH} + \text{pOH} = 14$
  - What is the p function?
12. Percent dissociation
13. Polyprotic or polybasic compounds
  - Being able to use multiple  $K_a$ 's or  $K_b$ 's.
14. Relationship between Structure and Acid Strength.
15. ICE TABLES
16. I am probably forgetting something...

## • Chapter 15 – Applications of Aqueous Equilibria

### 1. Buffers

- Weak acid + conjugate base
- Weak base + conjugate acid
- What do they do?
- How do they work?

### 2. Henderson – Hasselbalch equation

- ONLY WORKS FOR BUFFERS

- $$\text{pH} = \text{pK}_a + \log\left(\frac{[\text{A}^-]}{[\text{HA}]}\right)$$

### 3. Use of “Time Zero” step.

### 4. ICE TABLE

### 5. Titration curves

- Strong acid with strong base
- Weak acid with strong base
- Strong acid with weak base
- ½ equivalence point
- equivalence point
- Assorted calculations

### 6. Indicators

- $\text{HIn} \leftrightarrow \text{H}^+ + \text{In}^-$
- Calculate useful pH's
- For most indicators, the ratio of the minor form to the major form must be 1/10 before a color change is apparent.
- The goal in choosing an indicator is to have the equivalence point and the end point coincide.

### 7. Solubility

- Calculate to and from solubility to  $K_{\text{sp}}$
- How to determine if a solid is going to form or not from aqueous solutions.
- Use of Q
- Selective precipitation

### 8. I am probably forgetting something...