

CHM 321 Final Exam topic list Spring 2010

Know the rules for significant figures!!!

The major break down of the class material is as such:

General understanding of stoichiometry

Given chemical reactions or necessary information, be able to calculate %-yield/%-composition, conversion of concentration from, say molarity to ppm or w/w-%, w/v-%

EDTA titrations will fall under this category of general stoichiometry as will photometric titrations

Equilibria involved with precipitation

Know how to determine if a material will precipitate by analysis of K_{sp} and the ion product

Understand the difference between nucleation and particle growth

Know how LeChatelier's principle (common ion effect) AND the diverse ion effect (salt effect) can affect precipitation

Know how/when to apply ionic strength, activity coefficients, and Debye-Huckel equation

Acid-base equilibria

Finding pH of strong or weak acids/bases at any concentration

Buffers-what are they, how do they work, what is the buffer assumption (why does it work), calculating pH of a buffer, calculating the pH change after adding an acid or a base to a buffer

Finding pH of polyprotic acids, bases, and intermediate species

Determining the principle species

Calculation of pH during the titration of strong acids/bases with strong bases/acids

Calculation of pH during the titration of weak acids/bases with strong bases/acids

Calculation of pH during polyprotic acid/base titrations

Spectroscopy

Interactions of light with matter, including line versus band spectra for atoms and molecules, respectively

Beer's Law calculations, the limitations of Beer's Law, why it's important to measure at the λ_{max}

Components of spectroscopy (light sources, monochromators, detectors (phototubes, PMTs, photodiodes))

Equations given:
$$\alpha \pm \sqrt{\frac{K_{a1} \times K_{a2} \times C + K_{a1} \times K_w}{C + K_{a1}}}$$

and

$$\log \gamma = \frac{-0.51z^2 \sqrt{\mu}}{\left(1 + \frac{\alpha \sqrt{\mu}}{305}\right)}$$



"DON'T ADD POTASSIUM NITRATE TO ANYTHING THIS YEAR."



"My old lab was cluttered with test tubes, bottles, flasks, paper...Lord, how I miss it!"