

Ionic Equilibria

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Course Outline

- Introduction to equilibria
- The equilibrium constant
- Activity and activity coefficients
- Mass and charge balances
- Strong acids and bases
 - pH of strong acids, bases and mixtures
 - titration of strong acids and bases
 - Linearized (Gran) titration curve
- Weak monoprotic acids and bases
 - pH calculation
 - Sillen's diagram
 - titration curves
- Polyprotic acids and bases
 - ionic strength effects
 - degree of ionization
 - distribution diagrams
 - pH determination
 - mixture of polyprotic acids and bases
 - formation and titration curves
 - systems involving gas phase
- Solubility
 - ionic strength effects
 - separation of compounds by precipitation
 - precipitation titrations
 - acid-base effects
- Complex formation
 - distribution diagrams
 - ionic strength effects
 - complex formation effect on solubility
 - hydrolysis of metal ions

This intense course consists of 15 hrs of lectures and a computer lab component. A short computer assignment will be given each day, for a total of 5 assignments. Students will be credited with a total of 25 hrs for the course.

The course requires basic knowledge of thermodynamics as taught in the physical chemistry course. Functional knowledge of Microsoft Excel is necessary.