

CHEM& 163L: GENERAL CHEMISTRY WITH LAB III

Introduction to equilibrium, acid-base equilibria, ionic equilibria, chemical thermodynamics (first and second laws), electrochemistry, and nuclear reactions. Three hours of lecture and four hours laboratory. (E)

Course Student Learning Outcomes

1. Explain how equilibrium concepts apply to chemical systems, including acids and bases, slightly soluble ionic compounds, and complex ions.
2. Solve word problems for chemical systems at equilibrium to determine equilibrium constants, pH, and concentrations.
3. Predict and quantify the chemical behavior of acids and bases in aqueous solutions.
4. Analyze the relationship between cell potential, free energy, and the equilibrium constant for electrochemical redox reactions in aqueous and electrochemical systems.
5. Apply the basic principles of collision theory to explain the energetics of a chemical reaction and determine how the reaction rate is affected by reactant concentration, temperature, molecular sterics, and the addition of a catalyst.
6. Predict reactant order and formulate an experimental rate law using the initial rate method or the integrated rate law method and judge the reasonableness of a proposed reaction mechanism.
7. Develop laboratory practices for conducting experiments and reporting experimental results within the context of the scientific method including the proper application of significant figures, precision, and accuracy.

Credits: 5

Prerequisites: 2.0 or higher in CHEM& 162L or permission of instructor.

Program: [Chemistry](#)