CHEM C185L: GENERAL CHEMISTRY B LAB

Item	Value
Top Code	190500 - Chemistry, General
Units	1 Total Units
Hours	72 Total Hours (Lab Hours 72)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)
Local General Education (GE)	• CL Option 1 Natural Sciences (CB1)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5C Laboratory Activity (5C)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5C Laboratory Activity (5C)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B3 Laboratory Activity (B3)

Course Description

This course is the second semester of a two-semester sequence (CHEM C180L and CHEM C185L) which continues the examination of the basic principles of inorganic chemistry with a special emphasis on reaction kinetics, chemical equilibrium, acid/base and solubility equilibria, enthalpy, entropy and Gibbs free energy, electrochemistry, coordination chemistry, and nuclear chemistry. PREREQUISITE: CHEM C180 and C180L. COREQUISITE: CHEM C185. Transfer Credit: CSU; UC. C-ID: CHEM 120 S.**C-ID:** CHEM 120 S.

Course Level Student Learning Outcome(s)

1. Construct rate laws for chemical reactions and match possible mechanisms for these reactions using the rate data.
2. Distinguish between different types of chemical equilibria and calculate the predicted amounts of reagents and products under equilibrium conditions.
3. Perform thermodynamic calculations using enthalpy, entropy, Gibbs free energy, equilibrium constants, and standard potentials.
4. Define acids and bases using the applications of aqueous equilibria and use the oxidation reduction reactions to explain electrochemistry.
5. Identify the components of the atom according to modern atom theory, balance nuclear equations, and evaluate the progress of radioactive decay.
6. Balance redox reactions and calculate cell potential.
7. Describe current models for transition metal compound bonding and explore Ligand Field Theory.

Course Objectives

- 1. Perform and analyze the results of experiments in the chemistry lab safely and reproducibly.
- 2. Use laboratory equipment such as spectrophotometers, pH meters, and voltmeters as analytical tools
- 3. Estimate the accuracy and precision of laboratory data and present the data in using graphical analysis
- 4. Explain laboratory results using appropriate chemical theory

Lecture Content

See Lab Content

Lab Content

Measurements of reaction rates, establishing rate constants and rate laws Determining equilibrium constants and testing Le Chateliers principle Calculation of the enthalpy, entropy and Gibbs free energy of the triiodide system Evaluating Solubility Products Acid/Base Titrations conducted with pH meters Redox Titrations Measuring Reduction Potentials Construction and testing of an Electrochemical Cell Spectroscopic analysis of an Iron(III)-aspirin complex Preparation of Transition Metal Complexes

Method(s) of Instruction

- Lab (04)
- DE Live Online Lab (04S)
- DE Online Lab (04X)

Instructional Techniques

Demonstration Hands-on laboratory techniques

Reading Assignments

Pre-lab exercises Post-lab exercises

Out-of-class Assignments

Laboratory reports

Demonstration of Critical Thinking

Quizzes Problem Solving Exercises Laboratory reports

Required Writing, Problem Solving, Skills Demonstration

Completion of lab assignments.

Eligible Disciplines

Chemistry: Masters degree in chemistry OR bachelors degree in chemistry or biochemistry AND masters degree in biochemistry, chemical engineering, chemical physics, physics, molecular biology, or geochemistry OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Murov, Steven L. Experiments in General Chemistry, 6th ed. Cengage Learning, 2015 Rationale: - Legacy Textbook Transfer Data: Legacy text

Other Resources

1. Coastline Library