Indiana State University

CHEM 106L Section 001

General Chemistry II Laboratory

Catalog Course Description

A series of experiments designed to illustrate lecture topics from 106.

Faculty Information

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Office Hours:MWRF 1:00-2:00 pm and by appointment

Course Learning Objectives

Measure the vapor pressure of a liquid at different temperatures to understand the relationship between temperature and vapor pressure, and its connection with molar enthalpy of vaporization and normal boiling point. Determine the enthalpy of fusion of water to explore energy changes during phase transitions. Use the freezing point depression method to calculate the molar mass of a solute and apply colligative property principles. Determine the rate law for a chemical reaction using initial rate data to investigate reaction order and rate constants. Experimentally determine the rate constant for a second-order reaction to apply integrated rate laws. Measure how a reaction's rate constant changes with temperature to determine activation energy and explore the Arrhenius equation. Determine the equilibrium constant for a chemical reaction to connect concentration measurements with equilibrium theory. Perform pH titrations of weak acids to determine acid dissociation constants (Ka) and explore acid–base equilibria. Measure temperature changes during urea dissolution to determine thermodynamic parameters. Compare experimental observations and make a reduction potential table to predict the direction of redox reactions. Measure cell potentials for electrochemical cells to verify the Nernst equation and quantify redox behavior.

This course also meets the Foundational Studies Quantitative Literacy Learning Objectives.

Required Textbooks and Materials

(1) General Chemistry Laboratory II, Glendening et al. (5th ed.). (2) Scientific calculator.

Graded Elements of the Course

Prelabs, Lab Reports, Exams.