

MACTLAC

Cooperative Physical Chemistry Laboratory Manual (outline, abbreviated)

REFERENCE SECTION

Part One - Basic Techniques

- I. The observation of physical chemistry phenomena and the recording of data.
 - A. Personal - direct observation
 - B. Objective - automatic observations
- II. Treatment and representation of data. (Reino Hakala-Dept. of Chem., Howard ~~Clark~~ University)
 - A. Errors and their treatment
 - B. Empirical equations and their development
 - C. Poisson's and other distributions
 - D. Arithmetic and algebraic methods
 - E. Interpolation
 - F. Calculus methods
 - G. Graphical methods
 - H. Dimensional analysis
 - I. Other methods.
- III. Writing laboratory reports
- IV. Scientific writing for publication - brief suggestions
- V. Safety practices in the laboratory
 - A. Mechanical
 - B. Fire
 - C. Chemicals - most common ones only will be treated
 - D. Radiation
 - E. Electrical
 - F. Biological
- VI. Shop techniques
 - A. Glass working and handling
 - B. Tools and shop work
 - C. Plans, layouts, and templates - related to simple cases.
 - D. Waxes, lutes, and solvents
 - E. Soldering and brazing
 - F. Welding - elements of autogenous welding
- VII. The mechanical set-up of experiments
 - A. Planning of arrangement
 - B. Racks and stands
 - C. Clamps and clamping
 - D. Connections
 - E. Shielding
 - F. Stirrers and actuators
- VIII. Common electrical equipment
 - A. Sources of electrical energy for the laboratory
 - B. Measuring devices
- IX. Elementary electronics
 - A. Electron tubes
 - B. Solid state items - diodes and transistors
 - C. Miscellaneous

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- X. Thermometry and temperature control
 - A. Measurement of temperature
 - B. Verification and calibration
 - C. Thermostatic baths
 - D. Heater and furnace control
- XI. Manometry and pressure control
 - A. Measuring equipment
 - B. Control equipment
- XII. High vacuum techniques
- XIII. Calorimetry
 - A. Simple laboratory calorimetry
 - B. Bunsen ice calorimetry
- XIV. Optical equipment
 - A. Simple optics for the laboratory
 - B. Basic instruments
 - C. Intermediate instruments
- XV. Photography and photochemistry
 - A. Photography
 - B. Photochemistry
- XVI. Isotopes and radioactivity
 - A. Fundamental procedures and safety precautions.
 - B. Selected applications
- XVII. Advanced Instruments and Methods
 - A. X-ray - collimated - focussed
 - B. E.P.R.
 - C. E.M.R.
- XVIII. Equipment
 - A. Suggested equipment for desks
 - B. New equipment
- XIX. Recent developments
 - A. Instrument components
 - B. Methods