

THE MACTLAC PHYSICAL CHEMISTRY MANUAL

A Cooperative Project of the Midwestern Association
of Chemistry Teachers in Liberal Arts Colleges

W. C. OELKE, Editor

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REPORT 1964

To all members and associates of MACTLAC, and especially to those whose departments have become contributing members of this project, our appreciation and thanks for your help, suggestions, and encouragement during the past year.

The purpose, organization, and plans for this project were set forth in detail in our report for the year 1962. A few copies of this detailed report are still available and may be obtained by writing either your secretary or editor of the project. New MACTLAC members may wish to know that this project is a cooperative effort of physical chemists, within the MACTLAC organization, to evolve new or improved physical chemistry experiments, and to eventually publish a manual. We have contracts with D. Van Nostrand Co. to this end; the further successful development of the plan lies with us.

At present the following experiments are in duplicated form and have been distributed to cooperating departments for trial and criticism. Where noted, revisions have been made.

Measurement of Molecular Weight by Surface Tension	Thiessen and Cypher	1960
Distillation of Binary Mixtures	Sanders and Campbell	1960
Second Virial Coefficient of a Gas	W. C. Child	1960
Ratio of Heat Capacities, Kundt's Method	W. C. Oelke	1960
Measurement of Electrode Potentials	J. P. Huselton	1961
The Constant Temperature Bath	W. C. Oelke	1961
Ionization Constants by Spectrophotometry	F. E. Ray	1962
Conductivity of Aniline-Nitrobenzene Mixtures	Sellers, Sulzbach, Thiessen	1962
Characteristics and Use of Storage Cells	W. C. Oelke	1962
Determination of Decomposition Potentials and Related Properties	G. W. Thiessen	1962
Partial Molal Volumes	A. L. Hanson	1962
Heat of Ionic Reactions	A. L. Hanson	1962

Determination of the Ratio of Heat Capacities of a Gas Kundt's Method, Modification A. Revised	W. C. Oelke	1962
Determination of the Ratio of Heat Capacities of a Gas Modification B.	Neumiller and Palmer	1962
Phase Rule Study - The Acetamide-Salicyclic Acid System	C. D. Starr	1962
Concentration Cells and the Ksp.	Mack and France, Revised.	1963
Heat of Hydrolysis of Phenyl Acetate	Ingemar Wadso, adapted by W. C. Oelke	1963
Construction and Use of a Simple Heterometer	W. C. Oelk	1963
Study of Complex Ions	W. A. Deskin	1964

A number of experiments are presently being developed by various members. This is often a slow process, since it usually entails trial by members of actual classes and subsequent revision. It is hoped that some of these will be submitted to the Editorial Board this fall so that they can be duplicated and distributed yet this year. Experiments in progress are:

Distillation Column Studies and Determination of H.E.T.P.	A. C. Wilcox
Surface Tension by Drop Weight	A. L. Hanson
Vapor Pressure and Analysis of Data by Method of Least Squares	J. P. Huselton
Etch Figures on Quartz Crystals and Use of Polarizing Microscope	P. M. Wright
High Vacuum Techniques	E. E. Weaver
Differential Thermal Analysis	G. Hardgrove
Ion Exchange and Equilibrium Constants	James Finholt
Applications of the Polarograph	J. J. DeYoung
Kinetic Studies on the Mutarotation of Sugars	J. C. Nichol
Thermodynamics	Irwin J. Brink

(Note: Some of these commitments date back several years and may be no longer in progress. If so, the editor would like to be so informed. Also these and other members may have new ideas for experiments which they are presently bringing into fruition. We would be pleased to hear of these and to have them submitted for the MACTLAC manual.)

In addition to the above areas, there are a number of experiments in the old Mack and France Manuals which we believe are worthy of revision. This is especially true of those in areas of perennial interest or those which offer a starting point for class time research or projects. Titles of experiments which are presently available for revision are:

- No. 17. Reciprocal Solubility - Closed System
- No. 21. Homogeneous and Heterogeneous Catalysis-Velocity of Oxidation of Certain Dyes
- No. 22. Degree of Dissociation of N_2O_4
- No. 23. The Bismuth-Cadmium Melting Point Diagram
- No. 24. The Action of Light on the Ferric-Ferrous-Iodine-Iodide Equilibrium
- No. 26. Velocity and Order of Reaction
- No. 28. Quenching of Fluorescence
- No. 34. Preparation of A Standard Cell
- No. 35. Temperature Coefficient of a Daniel Cell
- No. 38. Buffer Solutions, Degree of Ionization and Chemical Constitution
- No. 40. The Adsorption of Oxalic Acid on Carbon

If you would like to help with one or more of these, speak or write to the editor for copies of the above. We badly need your help in this work of revision.

Writing of the reference section of the Manual has proceeded slowly during the past year, largely due to other personal and professional concerns of those involved. It is hoped that an accelerated pace can be maintained during the spring and summer of 1965. Help is also needed on certain portions of the reference section for which we have not already had volunteers.

Present membership in the Manual Group numbers 77 colleges. It is realized that not all of these seventy-seven have received a full complement of experiments completed to date. This is because some of the earlier experiments were mimeographed in small numbers and the stencils cannot be rerun with more modern equipment. All Colleges which are cooperating members of this group can look forward to receiving two new experiments on Gas Chromatography and one on Potentiometric Techniques which should be in the mail soon, barring unforeseen delays. The Manual Project is still financially solvent. A financial report will be given as part of the report of the treasurer of MACTLAC.

By -- W. C. Oelke, Editor
October 19, 1964