

Manmade Macromolecules

Time: 24 minutes
Format: 16 mm film and videocassette
Price: \$445 for film, \$310 for videocassette, rental is possible for about \$50
Cat. No.: M56083
Suppliers: The Media Guild (for purchase), 11526 Sorrento Valley Road, Suite J, San Diego, California 92121
University of Illinois (for rental), Film Center, 1325 S. Oak Street, Champaign, IL 61820

From a beautiful balloon floating over the camera to the industrial preparation of polymers, students are shown what these substances are and how they are formed. This film, produced by Open University/BBC-TV, gives a rather complete discussion of the laboratory preparations of three common polymers via both addition and condensation polymerization. These ideas are then carried out on the industrial scale, in a manner students will follow and enjoy. The film offers specific information in an area of organic preparation not covered in other films known to this reviewer. This excellent film is appropriate for a secondary chemistry class dealing with polymers.

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Sometimes something is produced that does not fit the general mold of our categories. This is the case with the Modular Laboratory Program in Chemistry, which is available from Willard Grant Press. Essentially this is exactly what the name implies, a "program" with over 165 experiments published as independent units. The entire series is edited by H. A. Neidig, with each module authored by different individuals. With this wide choice of expertly designed experiments available, the teacher is able to devise any combination of laboratory experiences that best suit his/her own classroom situation. Basically, these modules were produced for the college chemistry course, but experiments are available that are suitable for the secondary school classroom when the students become more proficient in laboratory techniques, perhaps during the latter half of the school year. Consequently, this can serve as a transitional device for students to move from the classic high school laboratory course to the college experience. A list of colleges and high schools using the program is included with the promotional material.

The experiments themselves are printed on heavy stock 8½ × 11-in. paper, perforated and punched to fit any regular three-ring notebook. While the student modules are professionally printed, the instructor's materials leave something to be desired since the reproduction that I received was of poor quality. But, I would not allow that to detract from the excellence of the entire program.

Besides the two reviews of this program that follow, the publisher encourages you to "see for yourself" by requesting free examination copies or by testing one module at no cost. Write to Ellen C. Erwin, Willard Grant Press, Statler Office Building, 20 Providence Street, Boston, MA 02116 for their free catalog.

Modular Laboratory Program in Chemistry

H. A. Neidig, Program Editor, Willard Grant Press, Boston, MA, 1980.

1

The Modular Laboratory Program in Chemistry is a collection of independent units. Not all of them are experiments, however. Some are best considered as exercises, others as demonstrations. Each unit contains all the information necessary to carry out the activity involved.

An instructor's information packet is available for each module and contains a list of equipment, reagents, suggestions, representative student data, answers to questions, and answers to the prelaboratory assignment, which is characteristic of most lab modules. Even though the program is written for the college and university market, the units are written in clear, concise, and simple language suitable for most levels of instruction in the high school. It is comforting to know that the experiments have been student-tested.

The publishers have offered to allow teachers to select investigations for review, which will be sent to them without charge. In addition, if the teacher then decides that one experiment should be class-tested, the publisher will send up to 25 copies for use by a lab section as a trial for both suitability and student enthusiasm.

Each experiment includes background information, procedure, calculation instructions, suggestions for further study, questions and problems, data sheets, and a prelaboratory assignment. Four of the modules have been selected as representative of the series.

A Study of Density: Oil and Vinegar (PROP-226)—W. W. Sonntag. This exercise is useful in introducing new students of chemistry to the proper use and precision of the graduated cylinder, the buret, and the analytical balance for data gathering. The data collected is utilized to calculate the density, and the problems and questions encourage the student to make judgements about the precision of the result as a function of instrument error or sample size. The clear discussion and simple exercises make the level of instruction appropriate for all chemistry students from liberal chemistry through A.P.

Chemical Modules: Lewis Structures (STRC-220)—H. A. Neidig and J. N. Spencer. This module consists of a paper and pencil exercise. It is a modified programmed instruction lesson where the student progresses from the Lewis structures of atoms and ions to the use of the duet and octet rules to predict single, double, and triple covalent bonding. The electron structure of a member of a family of elements is used to draw structures for other members, and then the program proceeds to mapping out the flow of electrons in chemical reaction equations. This exercise would be most appropriate for an academic high school chemistry class or as a review exercise for an A. P. chemistry class. Most students should complete the assignment in a reasonable amount of time.

Electrochemistry: Half-Cells and Half-Reactions (ELEC-219)—H. A. Neidig and J. N. Spencer. This is a "verification" type of experiment. The proper connection of clean electrodes, electrolytes, salt bridge, wire, and voltmeter will permit the proper recording of the cell voltage. The questions then relate this voltage to half-cell potentials and half-cell reactions. Because this investigation is probably best done as a demonstration, the authors have widely made this possible by writing the module in three parts.

Synthesis of Aspirin (SYNT-229)—R. Glogusky. This module provides a neat organic synthesis of a well-known pharmaceutical product for the teacher of high school chemistry who has always wanted to provide the student with such an experience, within the constraints of the standard laboratory glassware and the chemical supply easily available to most schools. This simple synthesis of aspirin has a built-in motivation which would be hard for even the most cynical student to resist. The reaction between salicylic acid and acetic anhydride takes 15–20 minutes, and, after separation and purification, the yield can be determined. The only additional reagent required is a little sulfuric acid. Additional tests are provided to test the reaction site for completion of the synthesis by the use of ethanol and iron III chloride, and for the decomposition of the aspirin by heating in the presence of moisture.

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