

New Books . . .

Nuclear Magnetic Resonance: Applications to Organic Chemistry

JOHN D. ROBERTS. McGraw-Hill Book Co. 1959. viii + 118 pages. \$6.00. Reviewed by F. A. GUNTHER, University of California, Riverside.

THIS TYPE of exposition of the broad basic principles of nuclear magnetic resonance spectroscopy, with detailed explanations of some applications in organic chemistry, has been eagerly awaited by chemists and others. Even though costly, the methods of NMR spectroscopy have been applied to an amazing number of varied and important problems since their initial exploitation only 12 or 13 years ago.

Professor Roberts has provided an enthusiastic, readable, and stimulating discussion of this new and valuable technique, even though he considers his book only a "guide to various applications of NMR spectroscopy and an introduction to more authoritative works." The extensive use of carefully designed, colored diagrams to clarify basic phenomena is particularly helpful. Although the applications of this new tool are many and diverse, the author has limited himself to the high resolution spectroscopy of liquids, which includes analytical, kinetic, and structural organic chemistry.

This tool's cost and complexity, and the need to acquire theoretical background to utilize it freely and to interpret NMR data intelligently, may be looked upon by some readers as barriers to its immediate and extensive use in the fields of agricultural and food chemistry. The same objections were raised with infrared spectroscopy only a few years ago; yet its practical applications in these fields today are legion.

The physics needed to understand the fundamentals of NMR phenomena and to interpret the data may have been oversimplified in this book, but again IR spectra are widely used by chemists without concern for the mathematics of absorption. In this connection, the many examples of research problems amenable to NMR study discussed in detail in the book refresh one's confidence in being able to utilize this tool without refresher courses in advanced physics.

There are five sections of approximately equal length in the book: the nuclear resonance phenomenon, the chemical shift, spin-spin splitting,

NMR and reaction kinetics, and nuclear quadrupole relaxation effects and double resonance. A very valuable problem section, Appendix C, offers essential practice in the gross interpretation of NMR spectra in terms of reasonable structure assignments. A valuable adjunct to this book will be the timely and excellent paper by Chamberlain on determining molecular structure by NMR of hydrogen [*Anal. Chem.* **31**, 56 (1959)].

In time there will be numerous applications of this technique in helping solve some of the subtle analytical and structural problems so abundant in agricultural and food chemistry. Every chemist in these fields should enjoy reading this brief book; possible applications to his own problems cannot help but come to mind.

LITERATURE AVAILABLE

Ammonia Hose. Catalog on two types of transport hose and one type of applicator hose for agricultural ammonia. Request catalog M680 from Dept. A&F, RAYBESTOS-MANHATTAN, INC., Manhattan Rubber Division, Passaic, N. J.

Conveyors. Illustrated catalog describes seven standard mechanical vibrating conveyors for high-speed conveying of most bulk materials. Write Dept. A&F, SYNTRON Co., 1222 Lexington Ave., Homer City, Pa.

Gravimetric Feeder. Bulletin on gravimetric feeder used for continuously weighing and feeding dry materials at high rates. Write for Bull. 35.20-2 to Dept. A&F, B-I-F INDUSTRIES, INC., 345 Harris Ave., Providence 1, R. I.

Hygrometric Catalog. Sixty nine pages on hundreds of pieces of moisture-detection, -control, and -alarm equipment. Available from Dept. A&F, AMERICAN INSTRUMENT Co., INC., 8030 Georgia Ave., Silver Spring, Md.

Insecticide Concentrate. Technical Bulletin on insecticide concentrate that combines Pyrenone and malathion for high knockdown and residual effect. Send request to Dept. A&F, Fairfield Chemicals. FOOD MACHINERY & CHEMICAL CORP., 441 Lexington Ave., New York 17, N. Y.

Leasing Industrial Trucks. Booklet covers various plans for the leasing of industrial trucks. Copies avail-

able from Dept. A&F, ELWELL-PARKER ELECTRIC Co., 4205 St. Clair Ave., Cleveland 3, Ohio.

Plant Nutrition Film. Sound motion picture points out major elements vital for proper plant nutrition, demonstrating how fertilizers, by furnishing these elements, make possible bigger crops and better profits. Produced for International Minerals, it is in full color. Available on loan from Dept. A&F, MODERN TALKING PICTURE SERVICE, INC., 3 E. 54th St., New York 22, N. Y.

Poultry Tranquilizer Film. Seventeen-minute, sound-and-color film covers highlights of Rutgers University conference on use of Ciba's Serpasil in poultry production. Obtainable through Dept. A&F, IDEAL PICTURES CORP., 233 W. 42nd St., New York 23, N. Y.; 58 East South Water St., Chicago 1, Ill.; 18 S. 3rd St., Memphis 3, Tenn.; or 1840 Alcatraz Ave., Berkeley 3, Calif.

Product Catalog. General catalog lists properties and uses of some 375 chemical products of Dow Chemical, including established products and developmental items. Write Dept. A&F, DOW CHEMICAL CORP., Midland, Mich.

Rotary Paddle Feeder. Data sheet on rotary paddle feeder designed to assure even, uninterrupted flow of small-size granular or nonflusky ground materials by eliminating pile-up or packing. Product data sheet No. 5901 is available from Dept. A&F, RICHARDSON SCALE Co., Van Houten Ave., Clifton, N. J.

Storing Corrosives. Bulletin sets forth details on Chemstor Glasteel tanks (glass inside, steel outside) for use in storage of corrosive or sticky products. Write for Bull. No. 975, Dept. A&F, Advertising, PFAUDLER Co., 1097 West Ave., Rochester, N. Y.

Unitized Weighing Systems. Bulletin on automatic measurements and control of bulk materials through unitized weighing systems of pre-engineered components. Bull. 14 available from Dept. A&F, WEIGHING & CONTROL COMPONENTS, INC., 567 E. County Line Road, Hatboro, Pa.

Urea. Four-page fact sheet on urea to be available next spring from new plant in Delaware. Copies can be obtained by writing Dept. A&F, Chemicals Division, OLIN MATHIESON CHEMICAL CORP., Baltimore 3, Md.