

**The reactions of triallylchromium(III) and of tetraallyldichromium(II) with 2-butyne** have been investigated by R. P. A. Sneeden and H. H. Zeiss. The catalytic activity of triallylchromium in the polymerization of olefins is already well-known. Both chromium compounds mentioned were allowed to react with 2-butyne under identical conditions; in each case the same four products were obtained, but in different relative amounts. (1,2,3,4-Tetramethyl-, penta-methyl-, and hexamethylbenzene, along with traces of 1,2,3,5-tetramethylbenzene.) Allyl groups originally bonded to chromium are not involved in product formation except in the case of hexamethylbenzene. The mechanisms of these reactions remain unexplained. / J. Organometal. Chem. 28, 259 (1971) / -Ee.

[Rd 368 IE]

**For the IR analysis of gas mixtures** a modified matrix isolation method is suggested by M. M. Rochkind; it is called pseudo matrix isolation (PMI) by the author. The gas is diluted 1:100 with nitrogen, and the mixture is frozen in "pulses" of 0.1 to 0.5 mmoles onto an IR transmitting substrate cooled by liquid H<sub>2</sub>. The technique compares favorably with conventional IR methods of gas analysis since rotational structure of gas spectra is suppressed and intermolecular interactions modifying the characteristic frequencies in pure frozen gases are virtually eliminated. The method is suitable for qualitative and quantitative analyses; detection limits of 0.05  $\mu$ moles per cm<sup>2</sup> covered with the frozen mixture are not uncommon. / Spectrochim. Acta 27 A, 547 (1971) / -Hz.

[Rd 370 IE]

## BOOK REVIEWS

**Physikalische Chemie** (Physical Chemistry). By E. A. Moelwyn-Hughes, edited and translated by W. Jaenicke and H. Göhr, with the special assistance of H.-D. Sabel. Georg Thieme Verlag, Stuttgart 1970. 1st ed., 714 pp., 269 Figs., 309 Tables. DM 59.80.

The German translation of the second English edition of the well-known book by Moelwyn-Hughes is very different in structure from the textbooks on physical chemistry that have been used until now in German universities. The first five chapters (about 150 pages) deal with the principles of the kinetic theory of gases, quantum theory, and chemical thermodynamics. Separate chapters are devoted to the intermolecular energy and partition functions. Considerable space (about 100 pages) is allotted to monatomic, diatomic, triatomic, and polyatomic molecules, including the discussion of light dispersion, light absorption, the Raman effect, and X-ray and electron scattering. Chapters 12 to 17 (about 200 pages) deal with the states of matter (crystalline state, gaseous state, metallic state, liquid state, solutions, ions). The chapter on interfacial phenomena is followed by the discussion of the chemical equilibria in homogeneous systems and of the equilibria in heterogeneous systems, which also embraces phase equilibria and electromotive forces. The last three chapters, which occupy about 100 pages, deal with kinetics. Some mathematical problems are discussed in an Appendix.

This arrangement of the material has both advantages and disadvantages. The reader who has already been introduced to physical chemistry will welcome the self-contained treatment of the monatomic or polyatomic molecules, the states of matter, or kinetics. He will learn much from seeing how many problems can be solved by simple models with the aid of statistics or how various theories are used in attempts to deal with a given problem. While the beginner will find the first five chapters relatively easy to understand, he will have difficulty in recognizing the relations between the various thermodynamic equations derived, since items that belong together are often necessarily situated far apart because of the arrangement of the book.

An excellent introduction to the use of statistical thermodynamics is offset by a quantum-mechanical treatment of the chemical bond that is too brief by present-day standards.

Very commendable features are the numerous references and the many exercises, which include not only calculations but also many questions designed to test the student's understanding.

The book would probably make excessive demands on the beginner, but it is a true mine of information for the advanced student.

Gerd Wedler [NB 952 IE]

**Undergraduate Instrumental Analysis.** By J. W. Robinson. Marcel Dekker, Inc., New York. 1st Edit., 379 pp., ca. DM 44.—.

During the past decade the methods of instrumental analysis – in particular absorption spectroscopy in the IR, UV, and visible ranges, NMR spectroscopy, mass spectrometry, and gas chromatography – have become a fundamental part of inorganic and organic chemistry. Nevertheless, up to the present no generally accepted methods have been developed in West Germany for the teaching of these techniques.

The present book attempts, with considerable success from the instructional point of view, to present instrumental analysis to the beginner along the lines of "What is instrumental analysis?" After a general introduction (survey of analytical methods, observation of errors, sample handling, etc.), the book gives an introduction to spectroscopy and the basic principles of spectrometric systems. Then follow chapters on NMR, IR, and Raman spectroscopy, UV absorption spectroscopy, atomic absorption, colorimetry and polarimetry, flame photometry, emission spectroscopy, X-ray spectroscopy, chromatography, thermal analysis, mass spectrometry, and electrochemistry. In each chapter the theoretical and practical principles of the method are described, and an indication is given of the range of applications on the basis of simple and (in general) well chosen examples. Each chapter