

Book Reviews

Gmelin Handbuch der Anorganischen Chemie, 8th Edition. *Mangan Teil C2: Verbindungen* (Oxomanganionen. Permangansäure. Verbindungen und Phasen mit Metallen der 1. und 2. Haupt- und Nebengruppe des Periodensystems). E. Schleitzer-Steinkopf Ed., Springer-Verlag Berlin/Heidelberg/New York, 1975.

The present volume of the Gmelin handbook covers, as a continuation of the previously published volume *Mangan C1*, the oxomanganese ions MnO_4^{3-} , MnO_4^{2-} , MnO_4^- and the permanganic acid. Following the description of formation of each individual ion, a detailed presentation of all available physical data is furnished. In view of the interest the bonding of these ions has received over the last few years, this section may be found particularly useful by many workers in the field, including physical chemists, physicists and theoreticians. As usual, the presentation is comprehensive, the discussion of results is expert and up to date. The results of quantum mechanical calculations are included as are data from EPR, X-ray structure and spectra, vibrational spectra with force and Coriolis constants, absorption spectra in the visible, UV and near IR regions, photoelectron spectra, NMR, luminescence, to mention just a few. A full discussion of the chemical behavior follows. Another two parts cover compounds and phases with the elements of the first and second group of the periodic table which the oxomanganese ions form. The same coverage and discussion of data as above is included.

Although the volume is written in German, the usual English translations of chapter and section headings are provided in the margin. In addition, each chapter is preceded by an introductory section which is presented in both German and English.

This volume is an important addition to the comprehensive coverage of inorganic compounds by the Gmelin Institute. Another important source of reference is thus established which will be useful to any person working in the field. The volume covers the literature until the middle of 1974.

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Radiochemistry – Vol. 2. G. W. A. Newton, The Chemical Society, London, 1975. viii + 248 pp. Figs and tables, 143 × 224 mm. Lst. 13.

Since 1967 the Chemical Society has been publishing the *Specialist Periodical Reports* series to provide systematic and comprehensive review coverage of the progress in the major areas of chemical research.

The present volume covers the same areas as Volume One (Solid State Recoil Chemistry, Radiochemistry of the Elements with $Z > 103$, and Radiochemical Methods of Analysis), and is a critical review of the literature published between August 1971 and December 1973. In addition the subject of Recoil Chemistry in Gases and Liquids has been included covering the period July 1969 to December 1973. The book is divided in four chapters and the subjects have been reviewed by experts; the Senior Reporter is G. W. A. Newton, Department of Chemistry, University of Manchester.

Ch. 1 – *Nuclear Recoil Chemistry in Gases and Liquids*, by S. Urch.

The emphasis in this chapter is on reactions in liquids and in gases, because it is often of great interest to compare and contrast reactions of a recoil atom in the gaseous and liquid states, and on the important distinction, from the chemical point of view, between the recoil chemistry of univalent atoms (hydrogen, halogens) and multivalent atoms (Groups VI, V, IV). The more practical aspect of the subject is in the formation of labelled substances and the production of radiopharmaceuticals labelled with short-lived isotopes, probably the most useful application of hot-atom chemistry.

Ch. 2 – *Recoil Chemistry of Solids*, by P. Glentworth and A. Nath.

The many papers reviewed indicate a very large interest on the annealing reactions of different compounds like Oxyanions (chromates, potassium permanganate), Phthalocyanines (copper, cobalt, cadmium, zinc), Acetylacetonates (chromium, cobalt) Double Complexes (cobalt, chromium, rhenium, indium) Organometallic Compounds (iron, manganese) and Complexes of cobalt, iron, chromium. Many workers have studied the chemical effects of nuclear transformations by using Mössbauer spectroscopy.

Ch. 3 – *Transactinide Elements*, by D. Hemingway.

The literature regarding superheavy elements has been summarized and divided in some sections in which predicted nuclear and chemical properties, methods of synthesis, and the natural occurrence (of superheavy elements) are considered. About this subject, most of the papers are theoretical ones because, unfortunately, costly machinery is required for the experimental preparation of superheavy elements.

Ch. 4 – *Radioanalytical Chemistry*, by G. R. Gilmore and G. W. A. Newton.

The radiochemical methods of analysis are finding increasing widespread routine use and the radioanalytical literature continues to proliferate, mainly by the efforts of activation analysis. At the present time the most exciting event is the increasing acceptance of the method in geochemistry, medicine, industry and many other fields. The radioanalytical literature has been divided in "Non-activation Techniques", "Activation Methods" and "Applications of Neutron Activation Analysis".

This book is a concise, well-organised and clearly written information source both to radiochemists and to nuclear chemists, particularly to those engaged in research concerning Recoil Chemistry and Radioanalytical Chemistry. Copies of this series should be in every university library where graduate work in Radiochemistry and Nuclear Chemistry is carried out.

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Hochdruck-Flüssigkeits-Chromatographie.

By H. Engelhardt. 52 Figures, 17 Tables x + 213 pp. Springer, Berlin 1975. Price DM 56, US\$ 23.

High pressure liquid chromatography or more correctly high performance liquid chromatography may be defined as the successful marriage of column chromatography and instrumental analysis. It became obvious from work on gas chromatography that column methods at ordinary pressures (*i.e.* low speeds) were inefficient compared to the resolutions obtained in gas and thin layer chromatography. Combining high pressures with suitable detectors as well as special adsorbents which permit fast equilibration, produces a method which can analyse complex mixtures in a matter of minutes with simultaneous quantitation. The book by Engelhardt is an excellent introduction to this new technique and in about 200 pages the author surveys all the possibilities of HPLC in adsorption, partition, ion exchange and gel filtration.

It is a book that every practical chemist will read profitably. At first sight he will be impressed by the excellent separations obtained, then he will realise that rather expensive equipment is required, then he will read that he will have to buy special adsorbents or supports which are sold in small bottles for big prices and finally he will realise that to set up a successful separation may take weeks. No doubt he then has a technique which will work automatically for months... But how often does he need this?

The book is well produced with numerous illustrations and an adequate bibliography.

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