Book reviews

The Index of Flame Retardants
Michael and Irene Ash (Compilers)
Gower Publishing Ltd, Aldershot, UK, 1997
325 pages. £95.00 hardback
ISBN 0-566-07885-6

Subtitled as an international guide to more than 1000 products by trade name, chemical, application and manufacturer, this reference work comprehensively covers all of the main compounds used as flame retardants along with several esoteric ones which find use in more specialized applications. Essentially, flame retardants can be divided into three major types—halogenated compounds, phosphorus compounds and inorganic compounds. The last of these groups includes both inorganic and organometallic compounds of antimony, tin, molybdenum, boron, zinc, aluminium and magnesium, and it is this category which has seen the greatest growth in recent years.

The book is divided into four chapters, with appropriate cross-referencing between trade names, chemical names, application areas and manufacturers/distributors. Each individual product entry contains useful information on chemical and physical properties, toxicology and relevant CAS and EINECS Inventory numbers. I noticed a few minor omissions and inconsistencies between chapters. For example, neither of the manufacturers of zinc hydroxystannate and zinc stannate, Alcan Chemicals and Joseph Storey, appears in the manufacturers' directory, despite the fact that both are listed as manufacturers/distributors in earlier chapters. Furthermore, a formula index might have been useful, particularly with regard to the large number of organic halogen and phosphorus compounds which are available.

However, these are minor criticisms of a 'user-friendly' directory which will be a valuable acquisition for chemists, polymer scientists, formulators and purchasing agents involved in the flame retardants industry. It maintains the high standard set by earlier indexes compiled by the same authors on antioxidants, solvents and antimicrobials.

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The Chemistry of Organophosphorus Compounds
Vol. 4: Ter- and Quinque-valent Phosphorus Acids and their Derivatives
F. R. Hartley (Ed.)
John Wiley & Sons, Chichester, 1996
945 pages £320.
ISBN 0-471-95706-2

This book is part of that very extensive series. 'The Chemistry of Functional Groups', which has been produced over the past few decades under the general editorship of Saul Patai and with the help of others, such as Zvi Rappoport and Frank Hartley.

Part 4 of *The Chemistry of Organophosphorus Compounds* completes the multivolume work on organophosphorus compounds and, as stated in the Foreword, is intended to cover phosphinous, phosphonous, phosphinic and phosphonic acid compounds and their halogen derivatives R_2PY, RPY_2 and $R_2P(X)Y_2$, where Y = halogen and X = O, S or Se. It follows very much the format of the previous volumes.

The titles of the individual chapters are: (1) The preparation and properties of tervalent phosphorus acid derivatives (by O. Dahl); (2) The synthesis of phosphonic and phosphinic acids and their derivatives: non-functionalized acids; (3) The synthesis of functionalized phosphonic and phosphinic acids and their derivatives. Part A: halo, hydroxy, epoxy, mercapto, carboxy and oxo functionalized acids; (4) The synthesis of functionalized phosphonic and phosphinic acids and their derivatives. Part B: diazo, nitro and amino functionalized acids; (5) The synthesis and reactions of thio- and seleno-phosphonic acids; (6) Properties and reactions of phosphonic and phosphinic acids and their derivatives (Chapters 2–6 are all written by R. S. Edmundson); (7) Acyl phosphonates and their derivatives (by E. Breuer); (8) Gas-phase positive and negative ion chemistry of organophosphorus compounds via mass spectrometric techniques (by R. A. J. O'Hair); (9) Biological activity of phosphonic and phosphinic acids, (by A. Kahil and H. H. Kair); and (10) The chemistry of organophosphorus chemical warfare agents (by R. M. Black and J. M. Harrison). The last chapter, written by scientists at the British Chemical and Biological Defence Establishment at Porton Down, was particularly fascinating.

As expected for a volume in this series, each chapter is well written by an expert or experts, contains a fund of useful information and is well referenced and, of course, there are good author and subject indices. The Saul Patai series remains one of my first ports of call when looking for information, on subjects both close to and somewhat

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