

In addition to the material you might expect to find in a book of this nature, it also contains a number of surprises. At first glance a chapter on capillary electrophoresis may seem out of place in a book on HPLC since traditionally electrophoretic techniques have been considered to utilize a different separation principle from chromatographic techniques. However, the recent advent of capillary electrophoresis has blurred the boundaries between these two areas with, for example, the technique of micellar electrokinetic capillary chromatography, exploiting simultaneously both electromigration and chromatographic sorption to achieve separation. This short chapter explains the basic principles of CE and gives a succinct account of the most important modes of CE used at present.

Another area covered in more detail than in many other books on HPLC is the description of ion-exchange sorption processes in modern HPLC techniques. This area is covered in three chapters, so there is potential for repetition. However, although some overlap is bound to occur, each author has focused on different aspects of ion separation and application to give a very comprehensive review of this field of analysis.

Overall I found this book well structured and well presented. It is certainly eminently suitable as a textbook for undergraduate students although the price may well mean it becomes a popular library text. It is, however, also suitable for a wide range of HPLC practitioners—from new users who want a better understanding of the technique through to the old hands' who want to catch up on the latest innovations, or perhaps want an insight into other areas of application. While reviewing the book I tried to think of something that may have been omitted, but I failed. True, some specialist areas such as metal speciation studies are not covered in great detail, but they are included and reference is made to more specialist texts. Thus, despite its cost (and weight!), I can thoroughly recommend this book to any user or potential user of HPLC.

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### **Anthropogenic Compounds, Part H. Organosilicon Materials**

G. Chandra (ed.)

### **The Handbook of Environmental Chemistry, Volume 3**

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Organosilicon materials are prime examples of anthropogenic or synthetic compounds, unknown in nature. A conservative estimate, based on current world sales of about 600 000 metric tons, suggests that more than

15 million metric tons of polymethylsiloxanes and related compounds have been released into the environment in one form or another in the last 50 years. The environmental fate of silicones is therefore a matter of high public interest. In an oxidizing environment the ultimate fate of silicones is conversion to carbon dioxide, water and silica. How, and whether, that occurs and what happens in the intermediate stages is the subject of active research, particularly by the silicone manufacturers themselves.

This recent volume in the *Handbook of Environmental Chemistry* series, edited by Grish Chandra of the Dow Corning Corporation, aims to give access to a single volume dedicated to commercial organosilicon materials: their structure, properties, manufacturing, environmental fate/effects, and the legislation that governs their use'. These aims are impossibly ambitious, but the book does bring together for the first time much of this information.

There are 12 multiauthor chapters that cover roughly three general themes. The first four chapters and the final one concern introductory and general topics, including the entry and predicted fate of silicones in the environment, their extraction and detection in trace quantities, ecotoxicity testing and a review of relevant physical properties. The next four chapters describe studies on individual classes of silicones. Three chapters describe the regulatory frameworks in the United States, Europe and Japan.

The book seems to demonstrate that whereas there are many issues around the environmental fate of silicones it is not (yet?) a problem'. It is a stimulating and sometimes frustrating read, but one that I do recommend to anyone with an interest in silicon or environmental chemistry. Individually, each of the chapters is well written and informative and the book is well produced. Like any multiauthor volume, there are problems in overlap and structure. It is very difficult to combine the twin aims of coherence in content and allowing authors to express a personal and individual perspective. The result in this volume is that there is more repetition of basic information about silicones and their structures and properties than was necessary.

The book does reveal clearly that the environmental analysis of silicones is very much a developing subject where there are not yet universally accepted methods of analysis. Chapter 2, by J. C. Carpenter and R. Gerhards, is an excellent critical description of the methods and techniques that are being used and some that are being developed. The problems of detecting and analysing minute quantities of materials are well understood in analytical environmental chemistry but the additional problems with silicones of high molecular weight and structural diversity add a further layer of complexity.

Modern approaches to environmental chemistry require a sophisticated understanding of physical properties and particularly the quantification of these properties. The chapter by S. M. Mazzoni, S. Roy and S. Grigoras summarizes comprehensive data for sili-

cones, concentrating particularly on various equilibrium partition constants, which are necessary in environmental calculations. This chapter is a rich source of quantitative data, much of which are unavailable from other sources.

As much of the silicone output ends up down the drain', the challenges of ecotoxicity testing are high and this is explored in another interesting chapter, written by C. Stevens and R. B. Annelin. Throughout the book there are discussions of down the drain' and other fates which are well summarized in the final chapter by G. Chandra, L. D. Maxim and T. Sawano.

Some issues raised by the book are worth airing. The vast majority of the authors and much of the published

material originate in the industry. There appears to be relatively little work from academic institutions, which is surprising given the complexity, challenge and theoretical interest in many of the problems. It is interesting that the editor stresses the environmental stewardship' of the silicone industry. This work confirms the seriousness with which environmental stewardship is taken by all of the major producers. Finally, Organosilicon Materials' reports work in progress', showing that there is much left to do in this fascinating and important area.

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