



Book review

Fluorine and the Environment: Atmospheric Chemistry, Emissions & Lithosphere, Advances in Fluorine Science, A. Tressaud (Ed.), vol. 1 Elsevier, Amsterdam (2006). 318 pp., GBP 95, Price: US\$ 165, ISBN: 978-0-444-52811-7

Fluorine and the Environment: Agrochemicals, Archaeology, Green Chemistry & Water, Advances in Fluorine Science, A. Tressaud (Ed.), vol. 2 Elsevier, Amsterdam (2006). 296 pp., GBP 95, Price: US\$ 165, ISBN: 978-0-444-52672-4

These two volumes are the first in a new series of books *Advances in Fluorine Science*, an important and timely subject given the worldwide interest on the effects of fluorinated compounds on our environment in general and the atmosphere in particular. The first volume, "Fluorine and the Environment: Atmospheric Chemistry, Emissions & Lithosphere," contains eight review chapters on both broad subjects such as "Fluorine in the Atmosphere" and narrower subjects such as "Fluorine Compounds in Gaseous Emissions from Industrial Sources: The Case of Ceramic Industries." The chapters are an eclectic mix of fundamental concepts and highly specialized topics written in a variety of styles and include reviews of the relationships of fluorinated compounds to the depletion of the ozone layer and contribution to the increase of global warming.

Chapters 1 (Ricaud and LeFevre) and 2 (Sekiya et al.) introduce the effects of fluorinated compounds, especially chlorofluorocarbons (CFC) on ozone layer depletion and global warming and the characteristics needed for CFC alternatives. These chapters are excellent summaries for both students and specialists in fluorine chemistry. Chapters 3–7 are more highly specialized. They are useful as a starting point and a compilation of references for people interested in these specific topics. Chapter 3 deals solely with the greenhouse effect of trifluoromethyl sulfur pentafluoride and the detailed properties of that molecule. Chapter 4 covers the preparation of possible refrigerants by dechlorination of fluorocarbon wastes such as CFCs and hydrochlorofluorocarbons (HCFCs). Chapter 5 discusses fluorine geochemistry, primarily the presence of HF and SiF₄ in volcanic emissions. Chapter 6 is even more specific and is entitled "Fluorine and Coexisting Volatiles in the Geosphere: The Role in Japanese Volcanic Rocks." The role of the industrial release of fluorine compounds to the atmosphere in the production of aluminum, iron and steel, ceramics and glass is noted in chapter 7. However, the chapter discusses only the ceramic industry in detail. Chapter 8 is an excellent discussion regarding the effects of fluorides in the environment on plants and

animals. The topic of perfluorinated sulfonic and carboxylic acids are noted in passing but are not discussed in detail. Hopefully this will be the subject of a future volume in the series.

This volume is uneven in breath of subject and in writing style. Three chapters are good reviews for specialists and generalists on the effect of fluorinated compounds in the environment while the other five are quite narrow but extremely detailed in their scope. Volumes of this type with chapters written by different authors on differing aspects of the same major subject tend to present the same information in many of the chapters. This is evident in the introductions to the chapters of this volume, the forward and the introduction of the book. The volume deserves a place in libraries because of the growing interest in the environment and the effects caused by natural and anthropogenic fluorinated materials.

The second volume, "Fluorine and the Environment: Agrochemicals, Archaeology, Green Chemistry & Water," contains eight chapters. With the exception of chapter 4, "Fluorine Containing Agrochemicals: An Overview of Recent Developments" and chapter 5, "Fluorine: Friend or Foe? A green Chemist's Perspective," the chapters are quite narrow in scope. There is some overlap of material in the first two chapters that deal with removal of fluoride ion from water but the different techniques for fluoride removal are compared and discussed in great detail. The other four chapters deal with "Calixpyrrole–Fluoride Interactions," "Metal Fluoride Mediated Oxyfluorination", "Fluorine Analysis by Ion Beam Techniques for Dating Applications" and a more general chapter "Fluorine and its Relevance for Archaeological Studies." These four chapters, as is the entire volume, are well written, well organized and highly detailed.

Both volumes should be included in libraries and are useful as references for research groups working with fluorinated compounds. It is doubtful that many people will read these volumes from cover to cover given the large diversity of topics and their high degree and depth of specialization. It is just these qualities that make them excellent reference works. There are some typographical errors and the reviewer's copy of the second volume contained two copies of page 128 and was missing page 127.

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