

## Book reviews

**Volatile Organic Compounds in the Atmosphere, R. Koppmann (Ed.). Blackwell Publishing, Oxford, UK (2007). 512 pp., Price: US\$ 199.99, ISBN: 978-1-4051-3115-5**

As I write this review, much concern is being expressed over the high concentration of air pollutants at the site of the forthcoming Olympic Games in China. Numerous tests are being conducted to determine concentrations of contaminants in order to devise ways of reducing them. Reduction of VOC contaminants in the atmosphere starts first with an analysis of the problem and an estimate of its magnitude; then control measures can be devised. The book approaches that problem in a very comprehensive way.

Every day, large amounts of volatile organic compounds are emitted into the atmosphere by nature as well as by man. VOC sources are ubiquitous, coming from fossil fuel use, biomass burning, terrestrial plants (the largest of the sources) and oceans. These compounds undergo numerous changes via reactions in the atmosphere.

The author notes in the preface that:

“In addition to influencing local, regional and even global photochemistry, several of these compounds have a potential impact on climate, both due to their properties as greenhouse gases and due to their ability to form aerosol particles on oxidation.

Thus, it is important that we understand the sources of these compounds, their transformations and their impact on the environment.

“Despite being found at extremely low concentrations, trace organic compounds have profound effects in the atmosphere. On the one hand, they are the ‘fuel’ which keeps oxidative atmospheric photochemistry running. Therefore, their sources, sinks and atmospheric residence times are the subject of much current research. To investigate organic trace gases in the atmosphere it is essential that accurate concentration measurements and careful modelling studies are made. In addition to influencing local, regional and even global photochemistry, several such compounds have a potential impact on climate, both due to their properties as greenhouse gases and due to their ability to form aerosol particles on oxidation.”

New methods of chemical analysis and modelling will assist in the foregoing task. Continuing development of more sophisticated and more sensitive analytical techniques will improve our

understanding of the emission, transformation and fate of these chemicals.

In the preface, Koppmann writes:

“This book describes the current state of knowledge of the chemistry of VOC as well as the methods and techniques to analyse gaseous and particulate organic compounds in the atmosphere. Chapter 1 is an instructive chapter summarising the variety and the roles of VOC in the atmosphere. Chapters 2 to 9 cover the various compound classes, their distribution in the atmosphere, their chemical transformations and their budgets as well as a survey of currently used measurement techniques. Chapters 10 and 11 describe new methods to measure a large part of the VOC family at a glance and for investigating their stable carbon isotope ratios. In-depth references are provided enabling each subject to be explored in more detail.”

To expand on the above synopsis, I thought it would be useful to include the book’s chapter titles:

- Volatile Organic Compounds in the Atmosphere: An Overview
- Anthropogenic VOCs
- Biogenic VOCs
- Oxygenated Volatile Organic Compounds
- Halogenated Volatile Organic Compounds
- PAN and Related Compounds
- Organic Nitrates
- High-Molecular-Weight Carbonyls and Carboxylic Acids
- Organic Aerosols
- Gas Chromatography-Isotope Ratio Mass spectrometry
- Comprehensive Two-Dimensional Gas Chromatography

Gary F. Bennett\*

*Department of Chemical and Environmental Engineering,  
The University of Toledo, Mail Stop 305, Toledo,  
OH 43606-3390, United States*

\* Tel.: +1 419 531 1322; fax: +1 419 530 8086.  
*E-mail address: [gbennett@eng.utoledo.edu](mailto:gbennett@eng.utoledo.edu)*

2 October 2007

Available online 11 October 2007

doi: 10.1016/j.jhazmat.2007.10.014