

## Book review

**Atmospheric Chemistry and Global Change** edited by G.P. Brasseur, L.L. Orlando and G.S. Tyndall (Oxford University Press, 1999), ISBN 0-19-510521-4. \$150.

Why write a new book on atmospheric chemistry? For *Atmospheric Chemistry and Global Change* the driving force is indicated in the cataloguing information. There the book is given the subtitle of 'a textbook prepared by scientists at the National Center for Atmospheric Research, Boulder, Colorado and other colleagues'. The concept seems to be to make use of the expertise present in Boulder to write a comprehensive and authoritative text on atmospheric chemistry. This has resulted in a book with 40+ authors and three editors, with individual chapters having up to 11 authors, plus additional contributors.

Do 'Too many cooks spoil the broth' or does 'Many hands make light work', or both? As outlined in the preface, the editors recognise some of the risks of the multi-author process, and have endeavoured to integrate the material. So there is a suggestion that for the editors it was not a light task, but for the reader...? The book consists of 16 chapters plus appendixes that contain a range of physical and chemical constants, as well as some sample problems. The text begins with an introduction to the fundamentals (atmospheric dynamics, chemical processes, aerosols and clouds and global biogeochemical cycles and budgets). It then looks at various chemical families (hydrogen, nitrogen, halogens, hydrocarbons and sulfur compounds). Thirdly, it gives a brief overview of observational methods and modelling. The final section contains chapters on ozone, climate and global change.

There are some very good summaries to be found in the book. For example, I found the summary of tropospheric nitrogen oxides well paced and explained. The sulfur chemistry chapter gives a brief but wide-ranging summary for both clean and polluted atmospheres. Strangely, although mentioned in the introduction to the chapter (and in the essay at the end of the chapter), there is no discussion of the climate feedback hypothesis driven by oceanic sulfur emissions.

However, some other topics are more difficult to locate. If, as a novice, you wished to find out about the chemistry of the ozone hole, you will find a diagram of total ozone over Halley Bay on page 4, you can read pages 124-126 and 151 on polar stratospheric clouds, pages 248-251 on the chemistry from a nitrogen-chemistry perspective, pages 311-313 for the chemistry from a halogen perspective (with similar but not identical diagrams) and pages 501-506 for the chemistry from an ozone perspective. At least most of these are listed in the index, so it would be possible to find them. Solar radiation is similarly scattered.

Some of the terminology is also uneven. This is seen in the use of mathematical symbols. In the introduction to Chapter 3 the quantum yield is given the symbol  $\Phi$ , and then in the text of that chapter and in the table of frequently used symbols at the start of the book  $\varphi$  is used. While  $h\nu$  is commonly used to mean a photon, and could be assumed knowledge, the terminology is explained at an undergraduate level a page after its use. If the reader needed the explanation, the introduction would probably have stopped them reading any further.

The book stumbles also in referencing. Most of the book is very well referenced but then there are tables that are totally un-referenced (for example Table 4.6, Relative Humidity of Deliquescence of Various Salts), although clearly it is a compilation.

So have the 'many cooks' spoiled the book? Well, coherence has certainly suffered from the multitude of authors, and it is not a book I would read from cover to cover. However, for graduate students and beyond willing to look there is a lot of useful and up-to-date information here. So while not 'light work', it certainly will enlighten! For a reference book, the topics are generally easy to find in the index, and well referenced to the source literature. At \$150 (pre GST!) it is reasonably priced for those with more than a passing interest in atmospheric chemistry.

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