



## BOOK REVIEW

**Aerosol Measurement: Principles, Techniques, and Applications**, edited by K. Willeke and P. A. Baron. Van Nostrand Reinhold, New York (1993). 876 pp., ISBN 0-442-00486-9. US \$100.

Aerosol science has emerged in the last quarter century as an important area of research and development. The understanding of the physical behavior of aerosols is essential in such diverse fields as air pollution and industrial health and safety, prevention of microcontamination in the production of microelectronic integrated circuits and high density magnetic recording devices, gas cleaning in gas turbine and stream turbine combined cycles, pharmaceutical and drug delivery aerosols, spray drying, filtration, catalysis and coagulation. Workers in all these various fields come from different backgrounds, for whom an extensive treatise on aerosols, as provided in the present book would be very useful.

This book provides a comprehensive anthology on aerosol characterization and measurement. It is written primarily for environmentalists, aerosol technologists, industrial hygienists, air-pollution regulators and legislators, and other practitioners. The exposition is straightforward with an emphasis on practice, rather than theory

The book is comprised of 38 chapters, divided into three parts. All the chapters of the book, but one, were contributed by members of American aerosol research centers, all known authorities in their respective fields. The editors, who have co-authored eight chapters of the book, have done an excellent job of integrating the various chapters of the other authors into a book of uniform style and form. The result is a monograph that offers an extensive compilation of most of the available up-to-date know-how on aerosol measurement methods and techniques.

The first part of the book consists of nine chapters, devoted to basic principles and fundamentals of aerosol science and technology. These include gas and particle motion, aerosol characterization, physical and chemical processes in aerosols, aerosol transport and sampling, data analysis and aerosol measurement quality. The second part is comprised of 14 chapters on instrumental techniques. The topics addressed, include physical and chemical analysis of particulates; inertial, gravitational and thermal collection techniques; filter collection techniques; optical particle counters; electrical techniques; condensation detection and diffusional separation techniques; instrument calibration; and data acquisition and analysis. The third part contains 15 chapters on applications of aerosol measurements in various fields related to aerosols. The fields covered include inhalation toxicology, industrial hygiene and health care, radioactive aerosols, aerosol emissions, indoor aerosols, atmospheric monitoring; as well as measurements in semiconductor clean-rooms, and manufacture of materials by aerosol processes. Each chapter is followed by an extensive bibliography.

The book holds 876 pages of which roughly 20% cover fundamental principles, 40% instrumental techniques, 35% applications, and the remainder contains a glossary of terms, tables of useful properties, constants and dimensionless numbers, and a subject index. No author index is provided, making the navigation among the numerous references a rather formidable task.

Most of the theory underlying aerosol measurement is presented in the first part of the book. The second part provides also useful equations where appropriate. The equations are presented without any derivations, and mostly without reference to where such derivations can be found. The use of the equations is highlighted by suitable calculations. The book contains 71 solved examples and sample calculations, roughly one half in part 1 with the other half in part 2 of the book.

The division of the book into three parts is logical and useful. Not always, however, is the classification of the topics clear-cut. In my opinion, chapter 32 on high-concentration and high-temperature aerosol measurement belongs to part 2 on instrumental techniques, rather than

to application, while chapter 12 on atmospheric sample analysis, and chapter 21 on bioaerosol sampling are more suitable for part 3 on applications.

This book provides a most thorough exposition on detection, sampling and measurement of aerosols. It can serve as a reference for the seasoned aerosol scientist, as well as an authoritative textbook for the newcomer to the field.

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