Atmospheric Chemistry and Physics. From Air Pollution to Climate Change.
3rd Edition

Description: Expanded and updated with new findings and new features

Since the second edition of Seinfeld and Pandis' classic textbook, significant progress has taken place in the field of atmospheric chemistry and physics, particularly in the areas of tropospheric chemistry, aerosols, and the science of climate change. A new edition of this comprehensive work has been developed by the renowned author team. Atmospheric Chemistry and Physics, 3rd Edition, as the previous two editions have done, provides a rigorous and comprehensive treatment of the chemistry and physics of the atmosphere including the chemistry of the stratosphere and troposphere, aerosol physics and chemistry, atmospheric new particle formation, physical meteorology, cloud physics, global climate, statistical analysis of data, and mathematical chemical/transport models of the atmosphere. Each of these topics is covered in detail and in each area the central results are developed from first principles. In this way the reader gains a significant understanding of the science underlying atmospheric processes and will be able to extend theories and results to solving real world problems.

The 3rd edition includes new chapters on Atmospheric Organic Aerosols and Global Climate, as well as a significantly updated chapter on Physical Meteorology. Many chapters and topics have been updated and expanded from the Second Edition, including the Chemistry of Biogenic Hydrocarbons in the Troposphere, especially Isoprene Chemistry; Aqueous–Phase Organic Chemistry; mechanisms of Nucleation in the Atmosphere; Aerosol–Cloud relationships; and Chemistry of Mercury. A new section on Positive Matrix Factorization is included that carefully develops this powerful statistical method for aerosol data analysis.

New problems have been added, especially ones at a basic level, to increase the utility of this text in classroom situations.

All chapters develop results based on fundamental principles, enabling the reader to build a solid understanding of the science underlying atmospheric processes. Readers familiar with the book will discover a text with many new and revised additions.

Atmospheric Chemistry and Physics, 3rd Edition is an ideal textbook for upper-level undergraduate and graduate students, as well as a reference for researchers in environmental and atmospheric science, chemistry, meteorology, and civil and environmental engineering.

John H. Seinfeld is Louis E. Nohl Professor at the California Institute of Technology. He is a member of the U.S. National Academy of Engineering, the U.S. National Academy of Sciences, and a Fellow of the American Academy of Arts and Sciences. He is the recipient of numerous honors and awards, including the American Chemical Society Award for Creative Advances in Environmental Science and Technology, the NASA Public Service Award, the Nevada Medal, the Fuchs Award, and the 2012 Tyler Prize.

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