Nucleation And Atmospheric Aerosols 2000 15th Int

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SWANSON REINA

Physical and chemical properties of AgI aerosols formed at simulated airborne conditions John Wiley & Sons
This book is a printed edition of the Special Issue "Morphology and Internal Mixing of Atmospheric Particles" that was published in Atmosphere
The Stratospheric Aerosol Layer Springer Science & Business Media
From July 7 to 12, 2008 in Zelenogradsk, a cosy resort on the bank of the Baltic Sea near Kaliningrad in Russia, the 1st International Conference “Atmosphere, Ionosphere, Safety (AIS-2008)” has been carried out. The State Russian University of I. Kant, Semenov Institute of chemical physics of the Russian Academy of Sciences, Pushkov Institute of terrestrial magnetism and radio-waves propagation of the Russian Academy of Sciences, and Russian Committee on Ball Lightning (BL) have acted as organizers of the conference. Financial support was made by Russian Fund of Fundamental Research Project N. 08-03-06041 and European Of?ce of Aerospace Research and Development Grant award FA8655-08-1-5052. The International conference “Atmosphere, Ionosphere, Safety” (AIS-2008) was devoted to (i) the analysis of the atmosphere–ionosphere response on natural and man-made processes, the reasons of occurrence of the various accompanying geophysical phenomena, and an estimation of possible consequences of their in?uence on the person and technological systems; (ii) the study of the monitoring possibility and search of the ways for the risk level decrease. Discussion of the physical and chemical processes accompanying the observable geophysical p- nomena was undertaken. One can see from a list of the Conference sections that questions of safety took only rather modest place, so main topics of the Conference became discussion of processes taking place in

the atmosphere, ionosphere and methods of monitoring these processes.
Nucleation and Atmospheric Aerosols, 1996 Springer
AgI [silver iodide] cloud-seeding nuclei were produced in a wind tunnel by both a flame generator and pyrotechnic at simulated aircraft speeds (150 to 200 mph). These aerosols were collected with isokenetic and anisokinetic samplers. By using electron microscope combined with X-ray energy spectrometer, we determined that particles' size, shape, chemical composition, photostability, and hygroscopicity. We also studied the relationship between these properties and the AgI aerosols' effectiveness as sublimation, condensation-freezing, and contact nuclei. All the aerosols' properties depend on the generating techniques, the additives mixed with AgI before combustion, and the quenching rate of the exhaust plume. From our study of the existing aerosol-generating methods, we developed a new method: combusting solid AgI in a flame generator. We found the aerosol's size distribution, chemical arrangement, and physical properties can be controlled by mixing another salt with the solid AgI; this promotes heterogeneous nucleation or modifies the surface characteristics during the vapor-to-particle transition. This new method has the potential of delivering an AgI aerosol having these properties required for ice nuclei in a particular cloud seeding operation.
Nucleation Theory and Applications CRC Press
These proceedings give a rather complete overview of the most recent research in the areas of fundamental processes and phase transitions, cloud droplet and ice nucleation in the atmosphere, and aerosol formation and aerosol characteristics in the atmosphere. Nine review papers on topics of special importance are supplemented by about 200 summaries on topics of greatest current importance. The volume should be of interest to scientists working in the atmospheric and environmental sciences, in chemistry and in physics, as well as to engineers working in these areas.
Atmospheric Aerosols Walter de Gruyter GmbH & Co KG
This volume is a collection of papers presented at the 14th International Conference on Nucleation and Atmospheric Aerosols, Helsinki, 26 - 30 August 1996. The first conference of this series took place in Dublin (1955); second, Basel and Locarno (1956); third, Cambridge (1958); fourth, Frankfurt am Main and Heidelberg (1961); fifth, Clermont-Ferrand and Tolouse (1963); sixth, Albany and University Park (1966); seventh, Prague and Vienna (1969); eighth, Leningrad (1973); ninth, Galway (1977); tenth, Hamburg (1981); eleventh Budapest (1984); twelfth, Vienna (1988); thirteenth, Salt Lake City (1992). The Atmospheric Aerosol conference has been held jointly with the Nucleation Symposium since 1988 in Vienna in order to stimulate contacts between researchers in these closely related fields. The broad nature of the meeting and the scientific program resulted in 32 countries submitting papers for presentation. Covering both experimental and theoretical studies these papers are divided amongst the chapters on Nucleation, Stratospheric Aerosols and Ice Nucleation, Tropospheric Aerosols and Aerosol-Cloud-Climate Interaction. In addition to these contributed papers invitations to present a plenary lecture on topics of particular current interest were accepted

by P.J. Crutzen, J. Gras, J.L. Katz, A.A. Lushnikov, D. Oxtoby, J.E. Penner, Th. Peter, F. Raes, S.E. Schwartz, R. Strey and G. Vali. These plenary papers together with the contributed papers provide a well-balanced perspective of the current research over the entire field and highlight some important issues.

Nucleation and Atmospheric Aerosols Elsevier

Filling a gap in the literature, this crucial publication on the renowned Lifshitz-Slezov-Wagner Theory of first-order phase transitions is authored by one of the scientists who gave it its name. Prof Slezov spent decades analyzing this topic and obtained a number of results that form the cornerstone of this rapidly developing branch of science. Following an analysis of unresolved problems together with proposed solutions, the book develops a theoretical description of the overall course of first-order phase transformations, starting from the nucleation state right up to the late stages of coarsening. In so doing, the author illustrates the results by way of numerical computations and experimental applications. The outline of the general results is performed for segregation processes in solutions and the results used in the analysis of a variety of different topics, such as phase formation in multi-component solutions, boiling in one- and multi-component liquids, vacancy cluster evolution in solids with and without influence of radiation, as well as phase separation in helium at low temperatures. The result is a detailed overview of the theoretical description of the whole course of nucleation-growth processes and applications for a wide audience of scientists and students.

Atmospheric Aerosols and Nucleation Elsevier

Introduction to Atmospheric Chemistry is a concise, clear review of the fundamental aspects of atmospheric chemistry. In ten succinct chapters, it reviews our basic understanding of the chemistry of the Earth's atmosphere and discusses current environmental issues, including air pollution, acid rain, the ozone hole, and global change. Written by a well-known atmospheric science teacher, researcher, and author of several established textbooks, this book is an introductory textbook for beginning university courses in atmospheric chemistry. Also suitable for self instruction, numerous exercises and solutions make this textbook accessible to students covering atmospheric chemistry as a part of courses in atmospheric science, meteorology, environmental science, geophysics and chemistry. Together with its companion volume, Basic Physical Chemistry for the Atmospheric Sciences (second edition 2000; Cambridge University Press), Introduction to Atmospheric Chemistry provides a solid introduction to atmospheric chemistry.

Introduction to Atmospheric Chemistry Elsevier

Aerosols, which are gas-phase dispersions of particulate matter, draw upon and con tribute to multidisciplinary work in technology and the natural sciences. As has been true throughout the history of science with other fields of interest whose un derlying disciplinary structure was either unclear or insufficiently well developed to contribute effectively to those fields, "aerosol science" has. developed its own methods and lore somewhat sequestered from the main lines of contemporary physical thought. Indeed, this independent development is the essential step in which syste matic or

phenomenological descriptions are evolved with validity of sufficient gen erality to suggest the potential for development of a physically rigorous and gen eralizable body of knowledge. At the same time, the field has stimulated many ques tions which, limited to its own resources, are hopelessly beyond explanation. As Kuhn pointed out in The Structure of Scientific Revolution [2nd enlarged edition (University of Chicago Press, Chicago 1970) Chapter II and Postscript-1969) this is a very common juncture in the development of a science. In brief, the transition from this earlier stage to the mature stage of the science involves a general re cognition and agreement of what the foundations of the field consist of. By this critical step, a field settles upon a common language which is well defined rather than the ambiguous, and often undefined descriptors prevalent at the earlier stage.

Encyclopedia of Surface and Colloid Science John Wiley & Sons

Expanded and updated with new findings and new features New chapter on Global Climate providing a self-contained treatment of climate forcing, feedbacks, and climate sensitivity New chapter on Atmospheric Organic Aerosols and new treatment of the statistical method of Positive Matrix Factorization Updated treatments of physical meteorology, atmospheric nucleation, aerosol-cloud relationships, chemistry of biogenic hydrocarbons Each topic developed from the fundamental science to the point of application to real-world problems New problems at an introductory level to aid in classroom teaching

Kinetics of First Order Phase Transitions John Wiley & Sons

VESUVIUS 2000 is an interdisciplinary project aimed at producing a safe and prosperous habitat for the people living around Vesuvius. To produce this environment requires an effective collaboration between the experts and the public, whereby the danger from the volcano is used to reorganize the territory and thus produce new opportunities for the people surrounding the volcano. As an all inclusive physico-mathematical-computer model of the volcano, the Global Volcanic Simulator is a key tool for determining the effects of different eruption scenarios and thus for urban planning of the territory. Unlike the evacuation plans which tend to manage emergencies, VESUVIUS 2000 aims at preparing the Vesuvius area to confront future eruptions with minimal socio-economic and cultural consequences. * Addresses volcanic risk mitigation in densely populated area surrounding Vesuvius * Provides education about volcanos * Displays physical modeling of eruption processes and integration of models

Nucleation and Atmospheric Aerosols 2000 Springer Science & Business Media

Atmospheric particles are ubiquitous in the atmosphere: they form the seeds for cloud droplets and they form haze layers, blocking out incoming radiation and contributing to a partial cooling of our climate. They also contribute to poor air quality and health impacts. A large fraction of aerosols are formed from nucleation processes – that is a phase transition from vapour to liquid or solid particles. Examples are the formation of stable clusters about 1 nm in size from molecular collisions and these in turn can grow into larger (100 nm or more) haze particles via condensation to the formation of ice crystals in mixed phase or cold clouds. This book brings together the leading experts from the nucleation

and atmospheric aerosols research communities to present the current state-of-the-art knowledge in these related fields. Topics covered are: Nucleation Experiment & Theory, Binary, Homogeneous and Heterogeneous Nucleation, Ion & Cluster Properties During Nucleation, Aerosol Characterisation & Properties, Aerosol Formation, Dynamics and Growth, Marine Aerosol Production, Aerosol-Cloud Interactions, Chemical Composition & Cloud Drop Activation, Remote Sensing of aerosol & clouds and Air Quality-Climate Interactions

Nucleation and Atmospheric Aerosols MDPI

This report was adapted from a Master's thesis supported by an ERL long-term University assignment at Colorado State University Fort Collins, Colorado pg. ii

Microanalysis of Atmospheric Particles Elsevier

This book provides the first comprehensive analysis of how aerosols form in the atmosphere through in situ processes as well as via transport from the surface (dust storms, seas spray, biogenic emissions, forest fires etc.). Such an analysis has been followed by the consideration of both observation data (various field observational experiments) and numerical modeling results to assess climate impacts of aerosols bearing in mind that these impacts are the most significant uncertainty in studying natural and anthropogenic causes of climate change.

Nucleation and Atmospheric Aerosols 1996 Springer Science & Business Media

Nucleation of Water: From Fundamental Science to Atmospheric and Additional Applications provides a comprehensive accounting of the current state-of-the-art regarding the nucleation of water. It covers vapor-liquid, liquid-vapor, liquid-ice and vapor-ice transitions and describes basic kinetic and thermodynamic concepts in a manner understandable to researchers working on specific applications. The main focus of the book lies in atmospheric phenomena, but it also describes engineering and biological applications. Bubble nucleation, although not of major atmospheric relevance, is included for completeness. This book presents a single, go-to resource that will help readers understand the breadth and depth of nucleation, both in theory and in real-world examples. Offers a single, comprehensive work on water nucleation, including cutting- edge research on ice, cloud and bubble nucleation Written primarily for atmospheric scientists, but it also presents the theories in such a way that researchers in other disciplines will find it useful Written by one of the world’s foremost experts on ice nucleation

NISTIR. CRC Press

The challenges faced by the atmospheric research community today are vast, complex, and multi-faceted. The book Urban Atmospheric Aerosols: Sources, Analysis, and Effects highlights important aspects concerning the chemical and optical properties, size distribution, sources, and potential health effects of fine urban air particles (PM2.5). The physical and chemical characterization of PM2.5, its source assignment, and the assessment of the magnitude and distribution of its emissions are crucial for establishing effective fine air particle regulations and assessing the associated risks to human health. This book brings together eight papers covering the main topics of the field and will be of interest to researchers who are interested in air quality in outdoor and indoor

environments, air particle toxicity, and atmospheric chemistry, as well as global climate modelers.

Aerosol Chemical Processes in the Environment Springer Science & Business Media

A compilation of the most important aerosol chemical processes involved in known scientific and technological disciplines, Aerosol Chemical Processes in the Environment serves as a handbook for aerosol chemistry. Aerosol science is interdisciplinary, interfacing with many environmental, biological and technological research fields. Aerosols and aerosol research play an important role in both basic and applied scientific and technological fields. Interdisciplinary cooperation is useful and necessary. Aerosol Chemical Processes in the Environment uses several examples to show the impact of aerosol chemistry in several different fields, mainly in basic and atmospheric research. The book describes the most important chemical processes involved in the various scientific and technological disciplines.

Morphology and Internal Mixing of Atmospheric Particles Springer Science & Business Media

Atmospheric particles are ubiquitous in the atmosphere: they form the seeds for cloud droplets and they form haze layers, blocking out incoming radiation and contributing to a partial cooling of our climate. They also contribute to poor air quality and health impacts. A large fraction of aerosols are formed from nucleation processes – that is a phase transition from vapour to liquid or solid particles. Examples are the formation of stable clusters about 1 nm in size from molecular collisions and these in turn can grow into larger (100 nm or more) haze particles via condensation to the formation of ice crystals in mixed phase or cold clouds. This book brings together the leading experts from the nucleation and atmospheric aerosols research communities to present the current state-of-the-art knowledge in these related fields. Topics covered are: Nucleation Experiment & Theory, Binary, Homogeneous and Heterogeneous Nucleation, Ion & Cluster Properties During Nucleation, Aerosol Characterisation & Properties, Aerosol Formation, Dynamics and Growth, Marine Aerosol Production, Aerosol-Cloud Interactions, Chemical Composition & Cloud Drop Activation, Remote Sensing of aerosol & clouds and Air Quality-Climate Interactions

Nucleation and Atmospheric Aerosols John Wiley & Sons

Atmospheric aerosols play a large role in air pollution in urban areas and in regulating climate. They also play a role in the ongoing debate on global warming potentials of various species. To understand the proper roles of aerosols in the atmosphere, we need data on their physical characterization, their chemistry and appropriate models to project into the future. Apart from general discussions in textbooks, there are not very many monographs devoted to the aspects outlined above. This symposium series book will describe the characteristics of atmospheric aerosols, the chemistry of aerosols, and finally the interplay between aerosol modeling and global climate changes using specific case studies. The book is organized into three sections: Characterization, Chemistry and Modeling of Atmospheric Aerosols. The characterization section of the book includes three chapters. The chapters include: The role of morphology on aerosol particle reactivity; The chemistry portion of the book covers several interesting topics including

secondary aerosols and the chapters include: Surface activity of perfluorinated compounds at the air-water interface; Atmospheric chemistry of urban surface films; Photochemistry of secondary organic aerosol formed from oxidation of monoterpenes; Finally the modeling section of the book includes two very interesting chapters; Understanding climatic effects of aerosols: modeling radiative effects of aerosols; Environmental effects to residential New Orleans following hurricane katrina: indoor sediment, vapor-phase and aerosolized contaminants.

The Atmosphere and Ionosphere CRC Press

The book describes the morphological, physical and chemical properties of aerosols from various natural and anthropogenic sources to help the reader better understand the direct role of aerosol particles in scattering and absorbing short- and long-wave radiation.

Atmospheric Aerosols Characterization, Chemistry, Modeling and Climate Springer

It is now a quarter of a century since Junge and his coworkers recovered the first sample from the sulfate aerosol layer in the stratosphere. Since that time vast strides have been made in determining its physical properties and morphology. These investigations have been performed with instruments on board aircraft and balloon platforms as in the early days, with ground-based lidar (optical radar), and most recently with satellite-borne optical instruments. It will become evident in Chapter 2 that in situ measurements by aircl'aft and ,balloon sensors complement rather than duplicate the remote techniques (lidar and satellite). Hence future programs will probably continue to utilize direct as well as indirect experimental techniques. Concurrently, with the observations of the gross properties of the aerosol layer, la~oratory and theoretical studies have sought to elucidate the chemical and micro physical processes which influence the formation and growth of the aerosol par ticles. The laboratory investigations have included studies of gas phase chemistry, and particle nucleation and growth mechanisms. Theoretical studies have revolved mainly around a series of models developed by atmospheric scientists. The earliest of these models was constructed by Junge and his colleagues. With the advent of third- and fourth-generation computers, the capacity to solve the quite complex continuity equations whi~h govern particle formation, growth, and removal has ad vanced to the point where most of the particle properties can be simulated with reasonable confidence.