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Ambient Air.

Standard Method for the Measurement of the Concentration of Nitrogen Dioxide and Nitrogen Monoxide by Chemiluminescence
Springer
We improved the assimilated daily inversion method by conducting model simulation, satellite retrieval, and inverse modeling sequentially on a daily basis. The improved procedure was applied to GOME-2 and OMI NO2 measurements over China in 2011, respectively. The new daily retrieval-inversion method significantly reduced the systematic bias in inverse modeling of NOx emission between using GOME-2 and OMI measurements, and detected more clear seasonal and weekly variations. OMI instrument observed NO2 columns over China from 2005 to 2010 were analyzed in order to estimate the top-down anthropogenic NOx emission trends. The estimated average emission trend is slower than the trend reported for previous years. We find large regional, seasonal, and urban-rural variations in emission trends. These results appear to suggest that a number of factors have significantly reduced or even reversed the increasing trend of NOx emissions in more economically developed

megacities and southern coastal regions, but their effects are not as significant in other major cities or less economically developed regions. A 1-D chemical transport model was applied to analyze OH and HO2 radical observations during the Pacific Atmospheric Sulfur Experiment (PASE) near Christmas Island (Kiritimati, 1.52°N 157.24°W) from Aug. 2 through Sep. 10, 2007. In two of fourteen research flights, significantly higher HO2/OH ratios in the buffer layer than the other flights were found. Model simulations indicated that fast-reacting oxygenated volatile organic compounds, which can react rapidly with OH and provide additional primary radical sources through photolysis, were necessary to explain the observations. During or right before these two flights, the WRF model simulated two strongest shallow convective events during this experiment, suggesting a transport pathway of ocean organics into the buffer layer. Ocean upwelling driven by atmospheric pressure depression during convection may expedite the release of ocean

organics. Measuring Soil Emissions of Reactive Nitrogen Oxides Air Pollution Control Directorate Atmospheric Sulfur and Nitrogen Oxides provides a thorough synthesis of the research on atmospheric sulfur and nitrogen oxide chemistry on geographically large scales, with special emphasis on the methods and difficulties of establishing source-receptor relationships. The book addresses the importance of long-range air transport, the role of ozone and oxidant chemistry, and it examines analytical methods and pollutant transport models. This text specifically covers: Ambient Ozone, Oxidants, and Nitrogen Oxides Measurements in the Houston Area DIANE Publishing This book covers the theory and applications of the differential optical absorption spectroscopic measurement technique for air pollution monitoring including the instrumentation and case studies, focusing mainly on atmospheric nitrogen dioxide measurements in Hong Kong using a LED based long path differential optical absorption spectroscopy instrument. As nitrogen dioxide is one of the most important pollutants in the

atmosphere with impact on atmospheric chemical processes and public health. The atmospheric nitrogen dioxide level correlated strongly with the traffic volume, which become a general problem for most of the metropolis. *Nitrogen Oxide Chemistry at Night* Elsevier O + O(,2) + M O(,3) + M *Methode Normalisee de Reference Pour Le Dosage (par Chimiluminescence) Du Dioxyde D'azote Dans L'atmosphere* World Health Organization Air, Quality, Air pollution, Gas analysis, Gas analyzers, Chemical analysis and testing, Determination of content, Nitrogen oxides, Nitrogen dioxide, Monoxides, Luminescence, Acceptance (approval), Approval testing, Measurement characteristics, Pollutant gases *Constraints on the Reactivity and Components of Nocturnal Nitrogen Oxides* Createspace Independent Publishing Platform NO and NO2 (NOx) are fundamentally important species to tropospheric chemistry. NOx abundances are tied to ozone production and thus determine the oxidizing capacity of the troposphere. Nocturnal reactions of NOx are often considered a major loss pathway for NOx and

ozone. Recent measurements have shown that nitryl chloride ($ClNO_2$) is produced at night by reactions of dinitrogen pentoxide (N_2O_5) on chloride containing particles. $ClNO_2$ is photolyzed during the morning hours after sunrise to liberate highly reactive chlorine atoms. This chemistry takes place primarily in polluted environments where the concentrations of N_2O_5 precursors, NOx, and ozone, are high, though it can likely occur in remote regions at lower intensities. The following describes estimates and ambient measurements of the reactive processes central to $ClNO_2$ formation and field measurements illustrating the potential importance of $ClNO_2$ as a NOx reservoir and as a chlorine atom source. The nocturnal reactions of N_2O_5 to form $ClNO_2$ were traditionally thought of as marine phenomena given the more obvious source of particle-phase chloride offered by sea spray emissions. However, long term chemical measurement databases and aerosol thermodynamic models are employed to show that this chemistry is likely widespread as is suggested by recent field measurements of $ClNO_2$ in Boulder, CO, a

site far removed from local sea salt aerosol sources. Direct measurements of N2O5 reaction probability on ambient aerosol particles were made in La Jolla, CA, using a custom flow reactor alongside measurements of aerosol particle size distributions and non-refractory composition. The largest apparent driver of day-to-day variability in the measured reaction probabilities at this site was the particle nitrate loading. The relative change as a function of particle nitrate illustrates the atmospheric importance of the so-called "nitrate effect" on N2O5 heterogeneous reactions that lead to the formation of ClNO2. The magnitude and sources of chlorine atoms in marine air remain highly uncertain but have potentially important consequences for air quality in polluted coastal regions. Continuous measurements of ambient nitryl chloride and molecular chlorine concentrations were made in southern California. In the Los Angeles region, ClNO2 was more ubiquitous than Cl2 during most nights of the study period. These observations are used to estimate the relative importance of chlorine atom sources in the polluted marine boundary

layer. In contrast to the emphasis in previous studies, ClNO2 and hydrochloric acid are likely the dominant primary chlorine atom sources for the Los Angeles basin. As part of a wintertime field study in Weld County, CO, vertically resolved ClNO2 and Cl2 measurements taken on a 300 meter tall tower are reported. Gas and particle phase measurements aboard a moveable tower carriage allowed for a detailed description of the chemical state of the nocturnal atmosphere as a function of height. These observations show significant vertical structure in ClNO2 and Cl2 mixing ratios that undergo dynamic changes over the course of a night. From these measurements ClNO2 yields from N2O5 aerosol reactions are inferred. The derived yields in these plumes suggest efficient ClNO2 production within distinct combustion plumes originating from the Denver-Boulder urban corridor. Finally, the effects of ClNO2 production, photolysis, and subsequent chlorine atom reactions on chemical species relevant to air quality are examined. ClNO2 formation is incorporated into an existing Master

Chemical Mechanism box model framework constrained by a large number of measurements taken during field studies in a polluted coastal environment. These results are compared to model runs excluding ClNO2 formation to assess the effects of ClNO2 on tropospheric oxidants, ozone, and nitrogen oxide partitioning.

WHO Guidelines for Indoor Air Quality

ScholarlyEditions

Oxides and acids of nitrogen play an important role in regulating atmospheric radical levels, in particular, that of the OH radical the main initiator of the degradation of chemicals in the atmosphere. A comprehensive overview on the methods used to measure nitrogen oxides and acids in the troposphere is given and difficulties and artefacts associated with the use of the techniques for measurements in urban and mega city environments is illustrated. State-of-the-art methods for the measurement of OH and HO2 radicals are reviewed and recently recognised difficulties, in particular with the measurement of HO2 radicals, are highlighted. Other contributions to the book cover our present understanding of the gas, aqueous and particulate/aer

osol phase atmospheric degradation chemistry of volatile organic compounds (VOCs) under NOx conditions typical of rural, urban and mega city environments. Examples of measurements of NOx and VOCs in the atmospheres of these environments are given, in particular for the megacities Cairo and Beijing, in conjunction with modelling studies which attempt to simulate the field observations using state-of-the art knowledge on the chemistry of the VOCs and radical levels.

Nitrogen Oxides in the Remote North Atlantic Troposphere DIANE Publishing

This book presents WHO guidelines for the protection of public health from risks due to a number of chemicals commonly present in indoor air. The substances considered in this review, i.e. benzene, carbon monoxide, formaldehyde, naphthalene, nitrogen dioxide, polycyclic aromatic hydrocarbons (especially benzo[a]pyrene), radon, trichloroethylene and tetrachloroethylene, have indoor sources, are known in respect of their hazardousness to health and are often found indoors in concentrations of health concern. The guidelines are targeted at public health professionals

involved in preventing health risks of environmental exposures, as well as specialists and authorities involved in the design and use of buildings, indoor materials and products. They provide a scientific basis for legally enforceable standards. **Atmospheric Sulfur and Nitrogen Oxides** LAP Lambert Academic Publishing Nitrogen Oxides—Advances in Research and Application: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Nitrogen Dioxide. The editors have built Nitrogen Oxides—Advances in Research and Application: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Nitrogen Dioxide in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Nitrogen Oxides—Advances in Research and Application: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed

sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

The Measurement of Nitrogen Oxide (NO, NO2) Exchange Over Plant/soil Surfaces

An array of automated dynamic flux chambers was built and deployed during a field campaign aimed at studying how biogenic soil emissions of nitric oxide (NO), nitrogen dioxide (NO2), and nitrous oxide (N2O) are impacted by soil vegetation. We found that the amount and ratio of NO-to-N2O depended on soil moisture, which in turn is impacted by the vegetation ground cover density. Precipitation caused pulses in total nitrogen emissions that were more pronounced in plots of bare soil vs vegetated soil, an observation attributed to nitrate that had accumulated in bare soil due to the lack of plant uptake. Fluxes of NO and NO2 measured at this site were used in combination with measurements of hydroxyl radical (OH), hydroperoxy radical + organoperoxy

radical (HO2 + RO2), ozone (O3), and volatile organic compounds (VOCs). These field observations were used within the Framework for 0-D Atmospheric Modeling (F0AM) to show that NO emissions are a significant driver of local OH radical production during the late afternoon and evening (20-90%) but are considerably less significant source of peak noontime OH radical concentrations (Photochemistry of Nitrogen Oxides and Ozone on Urban, Regional, and Global Scales The SASS Ozone and Nitrogen Oxides Experiment (SONEX) over the North Atlantic during October/November 1997 offered an excellent opportunity to examine the budget of total reactive nitrogen (NO(sub y)) in the upper troposphere (8 - 12 km altitude). The median measured NO(sub y) mixing ratio was 425 parts per trillion by volume (pptv). Two different methods were used to measure HNO3: (1) the mist chamber technique and, (2) chemical ionization mass spectrometry. Two merged data sets using these HNO3 measurements were used to calculate NO(sub y) by summing the reactive nitrogen species (a combination of measured

plus modeled results) and comparing the resultant values to measured NO(sub y) (gold catalytic reduction method). Both comparisons showed good agreement in the two quantities (slope > 0.9 and r(exp 2) > 0.9). Thus, the total reactive nitrogen budget in the upper troposphere over the North Atlantic can be explained in a general manner as a simple mixture of NO(sub x). (NO + NO2), HNO3, and PAN. Median values of NO(sub x)/NO(sub y) were approximately equal to 0.25, HNO3/NO(sub y) were approximately equal to 0.35 and Peroxyacetyl Nitrate (PAN)/NO(sub y) were approximately equal to 0. 17. Particulate NO3 and alkyl nitrates together composed **Nitrogen Oxides and Ozone Measurements at the Tropopause and Attributions to Convection and Lightning** Nitrogen Dioxide Measurements in Hong Kong Using Long Path Doas **ASME 70-WA/GT-3** *Improved Inverse Modeling of Nitrogen Oxides Emissions Using Satellite Measurements Over China and Evidence of Volatile Organics Emissions Over the Tropical Pacific* *Air Pollution Emission Test* **Measurements of Nitrous**

Acid, Nitrate Radicals, Formaldehyde and Nitrogen Dioxide for the Southern California Air Quality Study by Differential Optical Absorption Spectroscopy Measurement of the Concentration of Sulfur Dioxide, Nitrogen Oxides, and Ozone in the National Archives Building Air Pollution in Homes. 1.measurements of Carbon Monoxide and Nitrogen Oxides in Three Kitchens Nitrogen Oxides from Gas Turbines, Comparison Between Model Predictions and Measurements