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Infrared Emission from Gas-Aerosol Reactions Sep 1982 38 pages

Authors: Raymond A. Mackay; Edward W. Stuebing; DREXEL UNIV PHILADELPHIA PA DEPT OF CHEMISTRY

Full Text

... infrared emission by means of an exothermic reaction between a liquid **aerosol** and a **gas**. A number of gas-aerosol systems employing acid-base **reactions** have been examined and significant levels of radiation observed from the **reactions** of chlorosulfuric acid **aerosol** with gaseous amonia and water. Other systems which were screened including sulfuric acid-ammonia, octanoic ... have produced detectable levels of radiation. Some methods for the investigation of emission from the gas-aerosol **reactions** have been explored, and the results of these studies utilizing a ...

A Cloud Chamber Study of the Effect Which Nonprecipitating Clouds Have on the Aerosol Size Distribution Sep 30, 1992 50 pages

Authors: G. M. Frick; W. A. Hoppel; J. W. Fitzgerald; B. J. Wattle; NAVAL RESEARCH LAB WASHINGTON DC

Full Text

... passes through a nonprecipitating cloud cycle, a subset of the **aerosol** population called cloud condensation nuclei (... the droplets and undergo aqueous-phase chemical **reactions**, forming low-volatility products, such as sulfates, ... mass can have a dramatic effect on the **aerosol** size distribution, causing the CCN to grow ... of SO2 to H2SO4 and a dramatic change in the **aerosol** size distribution. Subsequent cloud cycles (... the same expansion rate and trace **gas** concentrations) exhibited very small mass ... pH of a droplet formed on a sulfuric acid **aerosol** particle one-fiftieth its size is about 5. Atmospheric ...

Source Characterization of Heavy Gas Dispersion Models for Reactive Chemicals. Volume 1 Dec 21, 1987 127 pages

Authors: Phani K. Raj; John A. Morris; TECHNOLOGY AND MANAGEMENT SYSTEMS INC BURLINGTON MA

Full Text

... are modeled including pressurized liquid releases, flashing and **aerosol** formation, two phase jet releases, explosive releases ... the differences in source characteristics, high-than-air density of clouds (due to **aerosol** presence, temperature or molecular weight). **Reactions** of the chemicals, if any, ..th ... are modeled and considered in the dispersion model. Transition from heavy **gas** dispersion to near neutral density dispersion is modeled without ... abrupt changes in size or discontinuity in concentrations. Keywords: Heavy **gas**, Dispersion, Mathematical model, Reaction, Source models, Concentration ...

The Aggregated State of Matter: Elucidating Transitions from the Gas to the Condensed Phase and the Formation of Aerocolloids Apr 21, 1989 39 pages

Authors: A. W. Castleman Jr; PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF CHEMISTRY

Full Text

... are influenced by the finite dimensions of the system--aerosols or aerocolloidal media in the **gas** phase, fine particles, clusters or thin films at the surface ... of phase transformations, condensed matter and surfaces, and **aerosol** science. In terms of application to programs of interest to the U.S. Army ... both natural and intentional methods of particle generation, the dispersal of agents, mechanisms of **reactions** that are involved in combustion and fast **reactions** in energetic ... in the area of propulsion and missile signatures, as well as **reactions** within and on small particles that bear on the areas ...

Molecular Beam Studies of Reactions between Stratospheric Gases and Supercooled Sulfuric Acid Apr 15, 2000 6 pages

Authors: Gilbert M. Nathanson; John R. Morris; Peter M. Behr; Melissa D. Antman; Jennifer Splan; WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

Full Text

... of the ozone layer by converting inactive gases like HCl and HBr into molecules that fall apart into chlorine and bromine atoms, which catalytically destroy ozone. The first step in these **reactions** is the transport of **gas** phase HCl and HBr molecules through the surface of the liquid **aerosol** and into the acid, where they dissolve and dissociate. Our experiments show that the entry of HCl and HBr into sulfuric acid is often frustrated by immediate HCl ...

Fundamentals of Soot Formation in Gas Turbine Combustors Aug 31, 1998 78 pages

Authors: Meredith B. Colket Iii.; Robert J. Hall; David S. Liscinsky; Mitchell D. Smooke; UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

... has been used to investigate soot production in the flame. Detailed transport and finite rate chemistry in the **gas** phase was coupled with the particle **aerosol** equations in the sectional representation. In comparison to

Full Text measured data obtained using intrusive and non- intrusive diagnostics, the model ... deficit was attributed to limitations in the PAH growth model. Oxidation of particulates was dominated by **reactions** with hydroxyl radical at superequilibrium levels. Radiation losses significantly effected predicted temperatures.

Laboratory Studies of Al(2)O(3)-NO(x) Aerosols Sep 30, 1999 13 pages

Authors: Robert Disselkamp; John R. Edwards; Daniel Pilson; Tyrrel W. Smith Jr.; TRW SPACE AND ELECTRONICS GROUP REDONDOBEACH CA

Full Text ... samples over time. Each **aerosol** was created using the same procedure. First, a reactant **gas** species, NO or NO(2), was added to the chamber and infrared spectra were collected over a 20-minute time interval to characterize heterogeneous **reactions** occurring on the chamber walls. Next, an aluminum oxide **aerosol** was generated by expanding powder into the chamber using nitrogen **gas** at high pressure. ... reported on in this paper enabled a quantitative characterization of both the rate of reactant **gas** uptake and product formation processes to be performed. A quantitative (i.e., ...

Interim Proposal for Molecular Beam Studies of Surfactants in Sulfuric Acid Aerosols: Comparisons Between Hydrocarbon and Fluorocarbon Alcohols May 1, 2003 6 pages

Authors: Gilbert M. Nathanson; WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

Full Text Heterogeneous **reactions** of **gas** phase molecules with aqueous sulfuric acid aerosols play a significant role in ... in the stratosphere. These processes include the acid-catalyzed **reactions** of HCl and HBr with ClONO2 (BrONO2) and ... is to determine the mechanisms and rate-limiting steps of **reactions** of these atmospheric gases with these supercooled sulfuric acid ... the **gas** phase or react in the interfacial or bulk regions of the **aerosol**. In this interim grant period, we have explored the ... uptake and thereby reduce the rates of heterogeneous **reactions** in the acid. These surface-active organic molecules are ...

Use of Surface Chemkin to Model Multiphase Atmospheric Chemistry: Application to Nitrogen Tetroxide Spills Mar 27, 2000 18 pages

Authors: Brian B. Brady; L. R. Martin; AEROSPACE CORP EL SEGUNDO CA MECHANICSAND MATERIALS TECHNOLOGY CENTER

Full Text ... chemistry and physics. It can deal with multiple phases having different reaction manifolds in each phase, it deals with **gas**, surface, and bulk **reactions** and mass transfer rates, it keeps track of the phase equilibria with realistic activities, and it can operate in an ... spill in the troposphere. The model is able to predict the formation of a nitric acid/water **aerosol** and to follow the chemistry taking place in both the **gas** and liquid phases as the spill dilutes in the surrounding atmosphere. The model predicts that in ...

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