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Ultraviolet CO Chemiluminescence in CH(X2II) and CH(a4sigma-) Reactions with Atomic Oxygen at 298 K Mar 29, 2004 38 pages

Authors: Ghanshayam L. Vaghjiani; ENGINEERING RESEARCH AND CONSULTING INC(ERC INC) EDWARDS AFB CA

Full Text

Production of ultraviolet CO **chemiluminescence** has been observed for the first time in the gas-phase pulsed laser photolysis of ... O2) reaction were measured by recording their time- resolved **chemiluminescence** in discrete vibronic bands. The CO. 4th Positive transition ... .2 nm were monitored in this work to deduce the decay kinetics of the **chemiluminescence** in the presence of various' added substrates. From this the second-order rate coefficient ... . Measured reactivity trends suggest that the prominent precursors responsible for the **chemiluminescence** are the methyfidyne radicals, CH(X2H) and CH(a4%-), ...

THE MECHANISM OF CHEMILUMINESCENCE IN OXIDATIVE REACTIONS IN SOLUTIONS Oct 21, 1967 16 pages

Authors: K A Allabutaev; R F Vasily'ev; A A Vichutinskiy; I F Rusina; ARMY BIOLOGICAL LABS FREDERICK MD

Full Text

Topics include: The reaction mechanisms; Measurement of oxidation speed by chemiluminescent methods; The determination of the lifetime of excited states with respect to the quenching of alien substances; The spectra of **chemiluminescence**; An estimation of radiation yield upon intensifying **chemiluminescence** via luminophores; The identification of the excited state; The secondary processes in chemiluminescent solutions; The nature of the special connection between **chemiluminescence** and oxidation.

A Review of Experimental Measurement Methods Based on Gas-Phase Chemiluminescence. Nov 1972 43 pages

Authors: Arthur Fontijn; Dan Golomb; Jimmie A. Hodgeson; PURDUE UNIV LAFAYETTE IND PROJECT SQUID HEADQUARTERS

Full Text

Measurement methods based on gas-phase **chemiluminescence** have found extensive use in a wide variety of disciplines such as homogeneous and heterogeneous reaction ... dynamics, aeronomy, analytical chemistry and air pollution (source and ambient atmospheric monitoring). **Chemiluminescence** intensity measurements are used to determine reactant and/or product concentrations from which are ... are discussed in the context of their specific applications. The majority of the report concerns itself with **chemiluminescence** used in air pollution monitoring and chemical release studies in the upper atmosphere.

CHEMILUMINESCENCE IN SOLUTIONS Nov 30, 1967 56 pages

Authors: R F Vasilev; ARMY BIOLOGICAL LABS FREDERICK MD

Full Text

The purpose of the work is to give a synopsis of the present condition of research of the mechanism of **chemiluminescence** and to discuss future developments in this field of physical chemistry. The synopsis is concerned with liquid-phase systems, but the other aspects of **chemiluminescence** are briefly touched upon in it.

CHEMILUMINESCENCE IN ORGANIC COMPOUNDS Aug 5, 1964 23 pages

Authors: Heinz Stork; ARMY BIOLOGICAL LABS FREDERICK MD

Full Text

The energy of the radiation emitted in **chemiluminescence** originates from a chemical reaction; it may be interpreted as the reversal of a photochemical reaction: in the same manner as the radiation absorbed in a photochemical process will entail a chemical reaction, the analogous is true in reverse in the case of **chemiluminescence** where radiation is a consequence of a chemical reaction.

Electrogenerated Chemiluminescence Jun 1988 10 pages

Authors: Allen J. Bard; TEXAS UNIV AT AUSTIN

Full Text

Electrogenerated **chemiluminescence** (ECL) has been investigated in a variety of systems under various conditions. Eleven completed publications plus one manuscript in preparation address the following areas: 1. ECL of novel inorganic complexes. 2. ECL from peroxyoxalate/ ... . 4. ECL at polymer modified electrodes. 5. Electroluminescence at semiconductor electrodes. 6. ECL from systems containing no added luminescer. 7. Inverse photoemission from metal electrodes. Keywords: Electrogenerated **chemiluminescence**, Metal electrodes, Electroluminescence, Micelle systems, Semiconductor electrodes. (mjm)

Gel State Chemiluminescence: An Artificial Electron Transport System Jan 1988 5 pages

Authors: Johnathan L Kiel; David M Simmons; David N Erwin; SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TX

Full Text

... used crosslinked glucose oxidase, horseradish peroxidase, and luminol-bovine serum albumin entrapped in filter paper disks to study the chemiluminescent properties of this macrophage-mimicking material. The disks showed a sensitivity to D-glucose down to 1 ug/ml. The luminescence was driven specifically by glucose at pH 6.0, 6.5, 7.0, 7.4, 8.0, and 10.0. The best signal-to-noise ratio, 44,705 to 1, achieved at pH 7.4. Superoxide was produced by the crosslinked system, and the **chemiluminescence** was dependent on hydrogen peroxide. Keywords: Gel; Peroxidase; **Chemiluminescence**; Oxidase; Reprints.

A Symposium on Bioluminescence and Chemiluminescence Jan 1, 1998 7 pages

Authors: J. W. Hastings; HARVARD UNIV CAMBRIDGE MA

Full Text

This grant provided travel and subsistence for scientists to attend and report research findings at the 9th International Symposium on Bioluminescence and **Chemiluminescence**, held at the conference facilities of the Marine Biological Laboratory, Woods Hole, MA from October 4 to 8, 1996. There were 256 persons registered and 169 abstracts submitted, all of which were published in the Journal of Bioluminescence and **Chemiluminescence**. The program was organized to have no parallel sessions except for one afternoon on education, so all attendees were able to attend all ...

AASERT 98 Student Research in Chemiluminescence 2001 3 pages

Authors: Arthur Fontijn; RENSSELAER POLYTECHNIC INST TROY NY DEPT OF CHEMICAL ENGINEERING

Full Text

... of rocket motor combustion products C2H2, C2O, and C2 with the atmospheric constitutents O and O2 was shown to lead to CO(4-X) (4+) **chemiluminescence**. The spectra and kinetics of the reactions were studied in a heatable pseudo-static photochemical reactor and in fast-flow reactors. The O + C2O and C2 + O2 reactions were shown to proceed through excited C2O2 intermediates. The **chemiluminescence** from C2 + O2 was used as the diagnostic for rate coefficient determinations; the results compared well to laser-induced fluorescence measurements, which led to k(293-1250 K) = ...

THE REACTION OF ATOMIC OXYGEN WITH ACETYLENE. (II) CHEMI-IONIZATION AND CHEMILUMINESCENCE. Apr 1965 30 pages

Authors: C. A. Arrington; W. Brennen; G. P. Glass; J. V. Michael; H. Niki; HARVARD UNIV CAMBRIDGE MA GIBBS CHEMICAL LAB

Full Text

The **chemiluminescence** and chemi-ionization resulting from the room temperature reaction of atomic oxygen with acetylene were investigated. The absolute intensity of chemiluminescent radiation and the over-all rate of chemi-ion formation were measured and the relative intensities of various individual chemi-ions have been observed with a T.O.F. mass spectrometer. The CH (A to the 2nd power delta - X to the 2nd power pi) system was found to be the most intense feature of the chemiluminescent spectrum. Weak emission from the C2 Swan bands and from the CN violet system was also observed. The ...

SOME PROBLEMS OF THE CHEMILUMINESCENCE MECHANISM Oct 21, 1967 9 pages

Authors: R F Vasilev; ARMY BIOLOGICAL LABS FREDERICK MD

Full Text

A discussion is given of a number of general problems bearing on the **chemiluminescence** mechanism.

Experimental and Theoretical Study of Chemiluminescence in Flames and of Combustion in Solid Propellants Dec 1970 74 pages

Authors: Pierre J. Van Teggelen; LOUVAIN UNIV (BELGIUM) LAB OF INORGANIC CHEMISTRY

Full Text

The two parts of the report deal successively with **chemiluminescence** in flames and with combustion of solid propellants. Relationships between chemiluminiscence (CL) and chemi-ionization (CI) on one hand, and the molecular structure of the fuel on the other hand have been put forward, in particular the structure of hydrocarbon fuels have been investigated. Applying the multimicrojet burner technique for the simulating study of heat transfer from the reaction zone onto the regressing surface of solid propellants, it has been possible to investigate the dependence of the heat release on ...

An Analysis of the Visible Chemiluminescence Observed in the Gas-Phase Oxidation of Aluminum and Its Compounds Apr 1974 45 pages

Authors: C. E. Kolb; D. R. Herschbach; M. E. Gersh; AERODYNE RESEARCH INC BILLERICA MA

Full Text

A mechanism based on the population of and emission from the (A doublet Pi) and/or lowest-lying quartet sigma (+) and quartet Pi states of AlO is suggested as an explanation for the visible **chemiluminescence** often observed in the gas-phase oxidation of aluminum. Data from upper atmospheric chemical release experiments utilizing aluminized grenades, aluminized burners, and trimethylaluminum are examined, and AlO(*) pumping steps based on the reaction of molecules containing loosely bound aluminum atoms with atomic oxygen are suggested. Previously proposed theories are shown to be unable to ...

CHEMILUMINESCENCE AS A SIGNALLING DEVICE Aug 1966 11 pages

Authors: J. Brennan Gisclard; AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB OH

Full Text

Reliable and unique signalling devices are a military necessity and the vagaries of nocturnal operations on land and sea engender a constant search for improvements and innovations. The phenomenon of **chemiluminescence** has been under study as a simple, reliable means of producing a unique light that might be adaptable as a signalling device. The chemical compound commonly known as luminol remains the best producer of 'cold' light. Various attempts were made to oxidize the compound using reagents that would be safe to handle and easily available for field use but would be capable of producing a ...

CHEMILUMINESCENCE OF CYCLIC HYDRAZIDES Aug 5, 1964 28 pages

Authors: Richard Wegler; ARMY BIOLOGICAL LABS FREDERICK MD

Full Text

The results of studies on the effects of catalysis and of substitution in the benzol ring on the **chemiluminescence** of phthalic hydrazides are reported.

Some Characteristics of Riboflavin Chemiluminescence Dec 1969 20 pages

Authors: Richard D. Towner; Harold A. Neufeld; Philip B. Shevlin; FORT DETRICK FREDERICK MD

Full Text

Data are presented that describe some characteristics of riboflavin **chemiluminescence** in the dark in the presence of hydrogen peroxide and osmium trichloride. The reaction, in terms of the light intensity produced, is affected by type of buffer, pH, and concentration of reactants. Light intensity is directly proportional to the concentration of riboflavin, and a 1,000-fold increase in relative light intensity is produced when osmium is present. The optimum pH for the reaction in phosphate buffer is 8.0 and in sodium hydroxide, 12. Spectral studies of the riboflavin chemiluminescent reaction ...

OH Alpha 2Sigma(+) Yields Chi 2Pi Chemiluminescence Measurements of Nsub2(+), Ar(+) + Hsub2O Hydrogen-Atom-Transfer Reactions at Suprathermal Energies Aug 15, 1992 10 pages

Authors: James A. Gardner; Rainer A. Dressler; Richard H. Salter; Edmond Murad; PHILLIPS LAB HANSCOM AFB MA

Full Text

Chemiluminescence attributable to OH Alpha 2Sigma(+) yields Chi 2Pi emission is observed in hydrogen-atom transfer reactions of Nsub2(+) and Ar(+) with Hsub2O. High-resolution OH Alpha yields Chi spectra (0.5 nm full width at half maximum (FWHM)) are presented as a function of collision energy in the range Esubc.m. = 5-20 eV. The spectra clearly show an increase in rotational broadening with collision energy. To reasonably fit the spectral data, simulations require contributions from two Boltzmann distributions with different rotational temperatures. It is proposed that the OH Alpha state is ...

Ultrasensitive Infrared Chemiluminescence Detection Oct 1993 353 pages

Authors: W. T. Rawlins; M. E. Fraser; K. W. Holtzclaw; W. J. Marinelli; H. C. Murphy; PHYSICAL SCIENCES INC ANDOVER MA

Full Text

... Additional experimental measurements in a discharge-flow reactor quantified the kinetics and spectroscopy of energetic IR precursor species including metastable electronic states of molecular oxygen, molecular nitrogen, and atomic nitrogen. Results from the experimental measurements were included in a critical review of nitric oxide kinetics, and were applied to predictive modeling of nitric oxide excitation in the auroral upper atmosphere. Infrared emission, **Chemiluminescence**, Nitrogen, Nitric oxide Molecular dynamics, Vibrational excitation, Atmospheric background, Mesospheric chemistry

Sulfur Chemiluminescence Detection Compared to Sulfur Flame Photometric Detection Dec 1998 21 pages

Authors: Michael W. Elizy; L. G. Janes; EDGEWOOD RESEARCH DEVELOPMENT AND ENGINEERING CENTER ABERDEENPROVING GROUNDMD

Full Text

Detection of compounds containing sulfur heteratom is traditionally accomplished using flame photometric detection (FPD). Sulfur **chemiluminescence** detection (SCD) is an alternative to FPD. This report compares the FPD with two SCD configurations using various sulfur containing compounds as probes. Attention was focused on detector linearity versus response.

An Evaluation of the Eclox Chemiluminescence Test, Hach Pesticide/Nerve Agent Test Strips, and Agri-Screen Test Tickets Jun 30, 2010 48 pages

Authors: David E van der Trader; William H Schalie; ARMY CENTER FOR ENVIRONMENTAL HEALTH RESEARCH FORT DETRICK MD

Full Text

The United States Army Center for Environmental Health Research (USACEHR) has developed an Environmental Sentinel Biomonitor (ESB) system to test Army drinking water supplies for the presence of toxic industrial chemicals (TICs). One of the technologies considered for inclusion in the ESB system was the Eclox **Chemiluminescence** Test, which, along with the Pesticide/Nerve Agent (P/NA) Test Strip is available as part of the Hach Eclox Rapid Response Water Toxicity Kit. The Eclox test and P/NA Test Strips are simple, rapid tests with sturdy packaging and materials, and the reagents used are stable ...

Chemiluminescence Chemical Detection of Vapors and Device. Jul 10, 1995 50 pages

Authors: Gregory E. Collins; Susan L. Rose-Pehrsson; DEPARTMENT OF THE NAVY WASHINGTON DC

Full Text

... phase chemical sensor includes a polymer film which has a chemiluminescent reagent immobilized therein. The polymer film and chemiluminescent reagent are chosen to significantly enhance the selectivity of the sensor to the analyte in the gaseous phase to which the sensor is exposed. The sensor is then positioned so that, when exposed to the gaseous mixture, any **chemiluminescence** generated will be detected by a photomultiplier tube or other photoelectric device, such as a photodiode. The sensor is particularly useful in the detection of O2, N2H4, SO2, NO2, and halogenated hydrocarbons. jg p40

Substituted Hydrazine Chemistry and Chemiluminescence in High Altitude Plumes. Aug 1973 52 pages

Authors: Ralph H. Kummler; Edward R. Fisher; Frederick P. Boynton; PHYSICAL DYNAMICS INC DETROIT MICH

Full Text

Hydrazine and amine based fuels are shown to undergo highly exothermic oxidation reactions which can be a major source of infrared energy under conditions appropriate to high altitude plume afterburning. In low pressure, high oxygen atom environments, a single step, highly exothermic mechanism is capable of initiating the emission

of infrared radiation. A specific set of reactions and energy transfer processes which characterize this potential emission are presented and an extensive review of the current literature related to amine oxidation is included. A flow field calculation directed ...

Effects of Hematoporphyrin (HPD) and a Chemiluminescence System on the Growth of Transplanted Tumors in C3H/HeJ Mice Apr 6, 1984 12 pages

Authors: M. J. Phillip; J. D. McMahon; M. D. O'Hara; F. W. Hetzel; C. Amsterdamsky; WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

Full Text

Photoradiation therapy is emerging as a promising technique for combating cancer. Fundamentally, this approach consists of two steps: (1) hematoporphyrin derivative (HPD) is used to selectively sensitize cancer cells to visible light; (2) after an appropriate time interval, light is introduced into the tumor via a laser-fiber optic system to trigger the cytotoxic action of HPD. The present investigation was initiated to determine the therapeutic potential of HPD in combination with a chemiluminescent activator in treating mice which had been transplanted with tumors.

Anamnestic Chemiluminescence of Murine Spleen Cells Jan 1984 7 pages

Authors: Lenora S Wong; Johnathan L Kiel; SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TX

Full Text

A Silicon Phthalocyanine and a Silicon Naphthalocyanine: Synthesis, Electrochemistry, and Electrogenerated Chemiluminescence Jul 30, 1984 28 pages

Authors: B. L. Wheeler; G. Nagasubramanian; A. J. Bard; L. A. Schechtman; M. E. Kenney; TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

Full Text

The synthesis, spectral characterization, and electrochemical behavior of bis(tri-n-hexylsiloxy)-2,3-phthalocyaninatosilicon its dimer, and its naphthalocyanine analog are described. All compounds show near UV absorption corresponding to Soret and N bands and intense absorption in the visible-near IR region corresponding to Q-bands.

Atmospheric Chemiluminescence: COCHISE and FACELIF Experiments Feb 24, 1989 172 pages

Authors: Steven M. Miller; D. R. Sinclair; Jeffrey I. Steinfeld; C. Fell; Charles M. Phillips; AIR FORCE GEOPHYSICS LAB HANSCOM AFB MA

Full Text

During the last four years, many experiments have been performed in the COCHISE facility. Each of these experiments has measured a fundamental chemical quantity such as a radiative branching ratio, a quenching rate coefficient or a product vibrational energy distribution. These measurements are then provided for incorporation into the various atmospheric radiation codes such as NORSE, ARC, and AARC, where they provide a solid experimental footing for modeling the complex chemical system of the upper atmosphere. Keywords: Nitric oxide; Nitrous oxide; Nitrogen; Carbon monoxide; Carbon dioxide ...

Surface-Catalyzed Chemiluminescence Dec 10, 1990 5 pages

Authors: Richard N. Zare; STANFORD UNIV CA

Full Text

Intense red emission peaking at 703 mm was observed when a heated metal wire was placed downstream of an O2 generator used in the chemical oxygen iodine laser (COIL) system. The O2 is produced by bubbling Cl2 through an alkaline solution of H2O2. Evidence has been found that this strong red emission requires the presence of both O2 and Cl2 in contact with a heated metal surface. Several metals have been used. The red emission spectrum is independent of the metal and the intensity is strongest for cooper. An attempt was made to observe laser action but no gain was detected. The identity of the ...

Chemiluminescence Measurements of the N2(+), N(+) + H2O Charge Transfer Systems at Suprathermal Energies: Direct Probe of the Dynamics of Large Cross Section Charge Transfer Processes Dec 15, 1990 4 pages

Authors: Rainer A Dressler; James A Gardner; C R Lishawa; Richard H Salter; Edmond Murad; PHILLIPS LAB HANSCOM AFB MA

Full Text

Chemiluminescence of Flames Sep 15, 1960 26 pages

Authors: V. Kondrat'yev; JOINT PUBLICATIONS RESEARCH SERVICE ARLINGTON VA

Full Text

Chemiluminescence and the Nomadics Spectrometer Card Jun 1999 17 pages

Authors: Anthony DeGregoria; AIR FORCE RESEARCH LAB TYNDALL AFB FL MATERIALS AND MANUFACTURING DIRECTORATE

Full Text

This report presents an experimental study on the potential of employing the Nomadics Spectrometer Card as an analyst of the visible light produced by certain chemical reactions. Following an outline of the experimental procedures, a discussion and analysis section interprets the resulting data and illustrates the value of the Spectrometer Card to chemiluminescent analysis. The final sections summarize the study's findings, describe

sources of error, and make recommendations for future uses of the Nomadics Spectrometer Card. All tables and graphs referenced in this report may be found in ...

Investigations of Chemiluminescence in the CH2 + O Gas Phase Reaction Mar 16, 2001 3 pages

Authors: Ghanshyam L. Vaghjiani; ENGINEERING RESEARCH AND CONSULTING INCEDWARDS AFB CA

Full Text

The interactions of carbonaceous combustion species in rocket plumes with the atmosphere are thought to play an important role in the production of ultraviolet, visible, and infrared radiation signatures at high altitudes. A detailed understanding of the pertinent chemical reactions that produce the electronically excited species, and of the competing quenching reactions that remove the internal energy in radiation-less processes is needed to accurately calculate plume spectral signatures and absolute radiances (in the short wavelength region), and their temporal/spatial evolution in the high ...

Investigations of Chemiluminescence in the CH2 + O Gas Phase Reaction Jul 2001 16 pages

Authors: Ghanshyam L. Vaghjiani; ENGINEERING RESEARCH AND CONSULTING INCEDWARDS AFB CA

Full Text

The reaction of ketene (C2H20) in a known excess of 0-atoms was studied in a discharge flow-tube apparatus. Characteristic CO-chemiluminescence was observed in the range 130-900 nm. The rate coefficient for this reaction was determined to be (6.82 + or - 1.02) x 10(exp -13) cu cm molec(exp -1) s(exp -1) at 295 K by recording the relative strength of the steady-state 216-nm Cameron emission as a function of the reaction length in the flow-tube. The band structure of the emission spectrum recorded suggests that the subsequent very rapid reaction of O-atoms with the product C2O and possibly with ...

Dynamics of HF(v,J) Chemiluminescence and Lasing by Infrared Hyperspectral Imaging Jun 2003 10 pages

Authors: S. J. Davis; W. T. Rawlins; D. B. Oakes; G. Dadusc; D. X. Hammer; PHYSICAL SCIENCES INC ANDOVER MA

Full Text

This paper presents results from a continuing investigation of mixing flowfields and optical gain profiles in HF chemical laser systems by infrared hyperspectral imaging. Chemiluminescent F + H2 reacting flowfields and chemical laser output beams are imaged at a series of wavelengths, 2.6 to 2.9 microns, by a low-order, spectrally scanning Fabry-Perot interferometer mated to an infrared camera. The resulting hyperspectral data cubes define the spectral and spatial distributions of the emission. High-resolution images can be processed to determine spatial distributions of the excited state ...

Effect of Equivalence Ratio and G-Loading on In-Situ Measurements of Chemiluminescence in an Ultra Compact Combustor Mar 2004 117 pages

Authors: Jason M. Armstrong; AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF ENGINEERING AND MANAGEMENT

Full Text

Using a spectrometer and high temperature fiber optics the relative intensities of the near-infrared, visible, and ultraviolet radiation emitted from the C2*, CH*, and OH* radicals were measured at eight discrete locations within the Ultra Compact Combustor test rig. Blackbody radiation in the near infrared also was observed. The tests were conducted at various g-loadings and overall equivalence ratios and with various air hole configurations. These measurements were compared to determine the effect of these changes on the radiation emitted. Local C2* intensities were used to estimate the ...

An Experimental Examination of the Relationship between Chemiluminescent Light Emissions and Heat-release Rate Under Non-Adiabatic Conditions Jun 2001 8 pages

Authors: L. C. Haber; U. Vandsburger; W. R. Saunders; V. K. Khanna; VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT OF MECHANICAL ENGINEERING

Full Text

... heat-release rate. In an effort to move in this direction using **chemiluminescence** as the measured quantity, this paper examines the formation ... premixed flames under non-adiabatic conditions. The main **chemiluminescence** emitters considered in the study are OH and ... flame burner. The study shows that although the **chemiluminescence** observed in the two burners behaves very ... , the variation can be fully understood. OH **chemiluminescence** is found to be a good indicator of heat-release in both ... rate. Based on the experimental results, the notion that **chemiluminescence** yield behaves linearly with flow rate ...

Propellant Aging Research Feb 1987 77 pages

Authors: Douglas B. Olson; Robert J. Gill; AEROCHEM RESEARCH LABS INC PRINCETON NJ

Full Text

... butanetriol trinitrate, and ammonium perchlorate were measured from about 310 to 375 K using a NOx **chemiluminescence** analyzer. The decomposition of butanetriol trinitrate was shown to undergo a mechanism change at ... not sensitive enough to reliably analyze early changes due to chemical aging. Polymer **chemiluminescence** resulting from chemical degradation of this series of propellant mixtures by reactive gases was also ... demonstrate the capabilities of the real-time NOx offgas analysis technique and the polymer **chemiluminescence** technique. Keywords: Propellant aging; Energetic materials; Kinetics.

Crossed Beam Studies of Some Chemiluminescent Reactions Producing IF Jul 15, 1991 35 pages

Authors: D. Khalil; N. Billy; G. Gouedard; J. Vigue; ECOLE NORMALE SUPERIEURE PARIS (FRANCE)

Full Text

... studies which were made under flow conditions, we have used a crossed-beam experiment. In these conditions, the **chemiluminescence** signal is very small for the reactions of the iodomethanes (if we except the particular case of CI4 ... due to iodine impurity), but this signal is considerably larger for HI. In this only case, the spectrum of the **chemiluminescence** was recorded, which shows that the emitter is well IF in its B state. This mechanism involves ... by steric arguments in the case of the CH3IF and similar radicals explaining the very low **chemiluminescence** branching ratio in these reactions.

Aging of Polymers and Composites Jul 21, 1981 74 pages

Authors: C. J. Wolf; D. L. Fanter; M. A. Grayson; MCDONNELL DOUGLAS RESEARCH LABS ST LOUIS MO

Full Text

... resin system, MY720 (Ciba-Geigy) cured with Eporal (Ciba-Geigy), were studied by the combined use of **chemiluminescence**, vaporization gas chromatography (and mass spectrometry), precision abrasion mass spectrometry, and stress ... the presence and absence of an external tensile stress (up to 50% of the ultimate tensile stress). The **chemiluminescence** peak intensity which occurs at a temperature change was found to be an inverse function ... of environmental parameters. Propenal, a low- temperature decomposition product of the resin, may be related to the **chemiluminescence** and aging processes. jg p3 &4

CHEMILUMINESCENT MATERIALS. Feb 29, 1964 78 pages

Authors: AMERICAN CYANAMID CO STAMFORD CT

Full Text

Chemiluminescence is discussed with primary reference to the C2O2Cl2-H2O2-fluorescent acceptor chemiluminescent reaction, chemiluminescent decompostition of anthracene photoperoxides, synthetic approaches to new potentially chemiluminescent compounds, and energy transfer in chemiluminescent ... acid decompostions are reported. A stable, solid chemiluminescent composition based on oxalic acid is described. Emitting species in peroxyoxalic acid **chemiluminescence** were shown to be the singlet excited state of the fluorescent acceptor present in the system. Preliminary energy transfer studies in the ...

CHEMILUMINESCENT MATERIALS Feb 28, 1965 73 pages

Authors: M. M. Rauhut; R. C. Hirt; AMERICAN CYANAMID CO STAMFORD CT

Full Text

Progress in determining mechanisms of processes fundamental to **chemiluminescence** is reported with particular reference to (1) studies of oxalyl peroxide **chemiluminescence** (2) studies of new, potentially useful, chemiluminescent reactions related to oxalyl peroxide decompositions, and (3) synthesis and exploratory studies of new potentially chemiluminescent systems.

CHEMILUMINESCENT SYSTEMS Nov 1966 161 pages

Authors: John S. Driscoll; J. A. Pirog; A. W. Berger; MONSANTO RESEARCH CORP EVERETT MA

Full Text

... field use. Over 175 organic compounds were investigated in the DMSO/t-BuOK/O2 system in a general screening program. It is concluded from the data that **chemiluminescence** is a very general phenomenon. Almost every compound studied gave at least weak emission. The indoles were the most promising ... emitter in the skatole system was unambiguously identified as the excited singlet state of the anion of orthoformamidoacetophenone (FAP). The agreement between the **chemiluminescence** spectrum of the skatole system, and the fluorescence emission spectrum of FAP is among the best to be found for any known ...

OBSERVATION OF ULTRAWEAK LUMINESCENCE OF ORGANISMS IN DIFFERENT GASES AND SUBJECT TO IONIZING RADIATION AND TEMPERATURE EFFECTS Oct 23, 1967 11 pages

Authors: Ts M Avakyan; N S Adzhyan; ARMY BIOLOGICAL LABS FREDERICK MD

Full Text

The report describes a device which makes it possible to record **chemiluminescence** of biosubstrates under the simultaneous effects of various gases, temperature and X-rays. By using this apparatus it is possible to maintain a pressure of up to 30 atmospheres in the recording chamber. This makes it possible to trace the oxygen effect, the temperature coefficient, **chemiluminescence** and to work with various protectors in X-ray work.

THE LUMINESCENCE OF LUMINOL XI Aug 12, 1964 23 pages

Authors: K. Weber; V. Mikulovic; ARMY BIOLOGICAL LABS FREDERICK MD

Full Text

... and criminological practice. There are various recipes for preparing the luminol reagent, among which that with sodium hydroxide yields equally intensive **chemiluminescence** regardless of whether it is a matter of fresh traces of blood (oxyhemoglobin) or dried spots (methemoglobin). The reagents with sodium carbonate or ... this reaction to detect blood spots is shown, and the results of the quantitative measurements concerning the influence of various natural substances on the **chemiluminescence** of luminol are given. Both catalytic and inhibitory effects were noted in the action of these substances.

Collisional Energy Transfer Mechanisms between Singlet Oxygen and Iodine Monofluoride Dec 1988 60 pages

Authors: William M. Lee; AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF ENGINEERING

Full Text

Chemiluminescence was observed from iodine Monofluoride (IF) excited by singlet oxygen in a gas flow tube reactor as a means to study the 02-IF energy transfer mechanisms. Although several researchers have demonstrated singlet oxygen's ability to efficiently pump IF(X) to the IF(B) state, the exact details of the processes have not been determined. The purpose of this research was to conduct IF(B) **chemiluminescence** spectral analysis and O2(1 sigma)- quenching experiments to further define the excitation processes and to develop plausible mechanistic models based on experimental results. The ...

Correction of Gain and Optical Throughput Variations in a Two- Dimensional Imaging Spectrometer Oct 28, 1988 9 pages

Authors: C. A. Monning; B. D. Gebhart; Gary M. Hieftje; INDIANA UNIV AT BLOOMINGTON DEPT OF CHEMISTRY

Full Text

... alternative approaches have been explored for such normalization, the method described in this paper is novel in its effectiveness and simplicity. In this approach, a **chemiluminescence** substance is introduced into a flat sample cell whose dimensions are large enough to ensure uniform coverage of the photodetector array of interest. Because the **chemiluminescence** solution is homogeneous, it can be used to uniformly irradiate the imaging detector; recording of the resulting image then indicates any variations that exist across ...

Annual Report on Office of Naval Research Grant N00014-86-G-0147 (Moss Landing Marine Laboratories) Dec 14, 1989 30 pages

Authors: Edward J. Green; MOSS LANDING MARINE LABS CALIF

Full Text

... chemicals in situ. We have developed a method for the determination of manganese that is based on its catalysis of the oxidation of 7,7,8,8-tetracyanoquinodimethan. The **chemiluminescence** produced by this reaction allows us to detect manganese at concentrations down to 0.1 nM with no significant interferences in seawater. ... in the coastal zone and in deep-sea hydrothermal vent plumes. Oxidation of brilliant sulfoflavine in the presence of iron(II) generates **chemiluminescence**, which can be used to determine iron concentrations to concentrations of at least 0.3 nM. Total iron concentrations can be ...

Investigation of Combustion in Large Vortices Aug 15, 1990 13 pages

Authors: Edward E. Zukoski; CALIFORNIA INST OF TECH PASADENA

Full Text

... combustion in vortex structures. Large vortices were formed utilizing pulsed flow over a downstream facing step. The technique for simultaneous shadowgraph, **chemiluminescence**, and laser doppler velocimeter measurements has been developed and is used regularly. For a pressure oscillation of fixed amplitude, ... grows linearly with time at a rate that increases linearly with the pressure amplitude of the oscillation generating the vortex formation. The onset of **chemiluminescence** - and we believe combustion - is delayed for several milliseconds, close to our estimates for the chemical time for the ...

Wide Temperature Range Kinetics of Plume Reactions Jun 1998 25 pages

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Authors: Ghanshyam L. Vaghjiani; AIR FORCE RESEARCH LAB EDWARDS AFB CA PROPULSION DIRECTORATE WEST

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... such as CH(A 2 delta) in C2H plus O or 02, and OH(A 2 Sigma plus) in CH + O2 reactions are also possible. CO-uv **chemiluminescence** has previously been identified in C2H + O2 reaction and both CO-uv and CO-vuv in the C2O + O reaction. However, no information is available on ... in CH and CH2 reactions has not yet been positively identified. Fast discharge-flow tube and pulsed-laser photolysis methods have been employed in this work to study the reaction kinetics and **chemiluminescence** in the ketene plus O-atom flame. The experimental approach used and the results obtained will be presented.

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