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[CO VUV-Visible Emissions During Laser Photolysis of Ketene in the Presence of Excess O-atoms](#) May 14, 2001 3 pages

Authors: [Ghanshyam L. Vaghjiani](#); [ENGINEERING RESEARCH AND CONSULTING INC EDWARDS AFB CA](#)

Full Text

... species such as CH(A(exp 2) Delta) in C₂H plus O or O₂, and OH(A(exp 2)Sigma+) 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 these and C₂O reactions. The experimental approach and results of these studies will be presented.

[IR Absorption Tomography for Active Combustion Control](#) Jul 31, 2003 17 pages

Authors: [F. C. Gouldin](#); [CORNELL UNIV ITHACA NY COLL OF ENGINEERING](#)

Full Text

... models of jet actuators. In the last year of the grant we expanded its scope to include the development of a camera system for measuring **chemiluminescence** from combustors to obtain a semi-quantitative measure of combustion heat release dynamics. Our research has been in collaboration with Drs. Orinstein and ... , reacting rectangular jets using proper orthogonal decomposition (POD), and in the past year work on the development of a new camera system for **chemiluminescence** emission tomography to obtain spatially resolved data on heat release dynamics. This work was a significant portion of two PhD ...

[248-NM Laser Photolysis of CHBr₃/O-Atom Mixtures: Kinetic Evidence for UV CO\(A\)-Chemiluminescence in the Reaction of Methylidyne Radicals With Atomic Oxygen](#) Jan 2005 46 pages

Authors: [Ghanshyam L. Vaghjiani](#); [ENGINEERING RESEARCH AND CONSULTING INC\(ERC INC\) EDWARDS AFB CA](#)

Full Text

... Temporal profiles of the CO(A) and other excited state products that formed in the photo-produced precursor + O-atom reactions were measured by recording their time-resolved **chemiluminescence** in discrete vibronic bands. The CO 4th Positive transition (A¹₁, v'⁺=0 i⁺ @ i⁺ X 1¹₁⁺ i⁺ @ i⁺, v''=2) near 165.7 nm was monitored in this work to deduce the pseudo-first-order decay kinetics of the CO(A)- **chemiluminescence** in the presence of various added substrates (CH₄, NO, N₂O, H₂, and O₂). From this, the second-order rate coefficient values were determined for ...

[LUMINESCENCE PRODUCED AS A RESULT OF INTENSE ULTRASONIC WAVES](#) Sep 30, 1953 1 pages

Authors: [VIRGINIA GRIFFING](#); [DANIELE SETTE](#); [CATHOLIC UNIV OF AMERICA WASHINGTON D C](#)

Full Text

... with A and CO. Observations were also made on ether, Me₂CO, MeOH, C₆H₆, and PhNO₂. Results show that luminescence is always accompanied by cavitation and starts at the same energy levels as cavitation. Various H₂O solutions show luminescence in the same relative amount as the yield of the chemical reaction caused by intense sound waves; the conclusion was that the phenomenon was **chemiluminescence**. Of the organic materials studied, only PhNO₂ showed luminescence, which may be due to some chemical reaction. An apparent frequency dependence for the intensity of luminescence was observed.

[Chemiluminescent Materials.](#) Aug 31, 1963 44 pages

Authors: [M.M. Rauhut](#); [R.H. Whitman](#); [P.T. Keough](#); [A.M. Semsel](#); [R.C. Hirt](#); [AMERICAN CYANAMID CO STAMFORD CT](#)

Full Text

... period has been divided between (1) assembly and calibration of radiometric apparatus, (2) synthesis designed to test the validity of several hypotheses, and (3) exploration of the behavior of a recently reported new chemiluminescent system. Apparatus intended for quantitative measurement of **chemiluminescence** as a function of time, temperature and wavelength has been assembled and calibration is virtually complete. Optional front side illumination has been included in the design to enable investigation of fluorescence and energy transfer phenomena at high concentrations. Three syntheses are ...

[THE MECHANISM OF THE ACETYLENE-OXYGEN REACTION IN SHOCK WAVES.](#) Aug 1964 1 pages

Authors: [G. P. Glass](#); [G. B. Kistiakowsky](#); [J. V. Michael](#); [H. Niki](#); [HARVARD UNIV CAMBRIDGE MA GIBBS CHEMICAL LAB](#)

Full Text

The oxidation of acetylene was studied using sufficiently high gas densities and concentrations of inert gas to keep the reaction isothermal and reduce boundary layer effects. The induction periods and exponential time constants of the oxidation were measured using the observations of: (1) **chemiluminescence** and gas conductivity in incident and in reflected shock waves, and (2) total ionization and product formation using a time-

of-flight mass spectrometer in reflected shock waves. The results are internally consistent, and the time constants are best represented by a logarithmic equation. (...

[CHEMILUMINESCENT MATERIALS](#)

Jun 30,
1965 86 pages

Authors: [Michael M. Rauhut](#); [L. J. Bollyky](#); [R. A. Clarke](#); [B. G. Roberts](#); [A. M. Semsel](#); [AMERICAN CYANAMID CO STAMFORD CT](#)

Full Text

Progress in determining mechanisms of processes fundamental to **chemiluminescence** is reported with particular reference to the chemiluminescent systems (1) oxalyl chloride-hydrogen peroxide-fluorescer, (2) acyl-oxalic anhydride-hydrogen peroxide-fluorescer, (3) 9-chlorocarbonylacridinium salt-hydrogen peroxide, (4) tetracyanoethylene-hydrogen peroxide-fluorescer. Exploratory searches for new chemiluminescent materials are also reported.

[ON THE HIGH REACTIVITY OF PEROXIDE RADICALS IN AN OXIDATION-REDUCTION REACTION](#)

Nov 1968 11 pages

Authors: [V. M. Goldberg](#); [L. K. Obukhova](#); [PICATINNY ARSENAL DOVER NJ FELTMAN RESEARCH LABS](#)

Full Text

The salts of variable-valence metals are widely used as oxidizing catalysts for various organic substances. It is known that the rate of the oxidation reaction directly depends on the concentration of the active centers - the peroxide radicals RO_2 . The interaction between peroxide radicals and manganese stearate was investigated with the aid of a **chemiluminescence** setup described by Vasil'yev et al.

[INVESTIGATION OF PHOTOCHEMILUMINESCENCE OF HUMAN BLOOD PLASMA](#)

Oct 1969 9 pages

Authors: [E. G. Dontsova](#); [S. A. Predtechenskij](#); [I. I. Sapezhinskij](#); [ARMY BIOLOGICAL LABS FREDERICK MD](#)

Full Text

The photochemiluminescence of solutions of human blood plasma is conditioned mainly by proteins; the greatest contribution in luminescence is made by serum albumin. In the investigated samples of blood plasma the activators and extinguishers of **chemiluminescence** are absent. In plasma there are no perceptible quantities of acceptors of protein free radicals. Data were obtained on the regularities of free radical processes which take place in UV-irradiated plasma. On the basis of kinetic experiments it follows that during the irradiation of blood plasma protein free radicals emerge. ...

[Studies of Atmospheric Processes](#)

Jun 15,
1972 38 pages

Authors: [Frederick P. Boynton](#); [Edward R. Fisher](#); [Ralph H. Kummler](#); [Pieter K. Roj](#); [WAYNE STATE UNIV DETROIT MI RESEARCH INST FOR ENGINEERING SCIENCES](#)

Full Text

The research described in this report is aimed at characterizing the non-equilibrium flow and coupled chemistry associated with the interaction of rocket exhaust effluents in the upper atmosphere. Infrared **chemiluminescence** emitted from the reaction between O and C_2H_4 has been quantitatively measured under lean conditions. The ratio of the rate coefficients for the reactions $CHO + O$ to $CO + OH^*$ and $CHO + O_2$ to $CO + HO_2$ was found. The rate coefficient for the reaction $CH_2O + O$ to $CHO + OH$ was also determined. A compilation of all available cross section information is included herein for use in ...

[THE LUMINESCENCE OF LUMINOL IX](#)

Aug 12,
1964 25 pages

Authors: [K. Weber](#); [Lj. Huic](#); [M. Mrazovic](#); [ARMY BIOLOGICAL LABS FREDERICK MD](#)

Full Text

Quantitative photoelectric measurements of the intensity of emitted light were used to investigate the catalytic action of isopestox on the **chemiluminescence** of luminol in the presence of hydrogen peroxide in alkaline solutions. Isopestox in relatively small concentrations considerably increases the intensity of the luminescence of luminol. The Michaelis constant was determined for this reaction, which may be regarded as a model reaction of the enzymatic (peroxidative) effect of the organophosphoric compound isopestox.

[Feasibility of New Lasers](#)

Nov 8,
1974 63 pages

Authors: [Lawrence H. Hall](#); [ROCKETDYNE CANOGA PARK CA](#)

Full Text

The objective of the study was to investigate selected alkali-metal halogen reactions to evaluate their potential for new chemical lasers at suitable wavelengths. The **chemiluminescence** of the alkali-metal atoms was spectroscopically observed and was analyzed to measure population inversions in the excited electronic states of the alkali-metal atoms as a function of reaction conditions. The conditions included nozzle configuration, reactant ratios, and reactant pressures for the Cs/F_2 reaction system. Spatial scans were performed, and gains were calculated for all observed population inversions ...

[Characterization of Air Particles Giving False Responses with Biological Detectors](#)

Jul 1975 78 pages

Authors: [Richard E. Putscher](#); [Walter C. McCrone](#); [MCCRONE \(WALTER C\) ASSOCIATES INC CHICAGO IL](#)

Full Text

A comprehensive selection of air background particles representing 13 categories and a total of 552 different substances were tested for 'alarm-like' responses in the **chemiluminescence** biological detector. Biological particles were most active in these tests and were also implicated as the cause of false alarm responses by the detector in open air tests upon examination of samples collected at the time of the alarms. Methods for eliminating detector responses to biological background were studied with major attention being given to separating biological aerosol from background particles by ...

[The Effects of Anthrax Toxin Components on Human Neutrophils Infection and Immunity](#)

Jun 13,
1984 25 pages

Authors: [J. C. O'Brien](#); [A. Friedlander](#); [T. Dreier](#); [J. Ezzell](#); [S. Leppla](#); [ARMY MEDICAL RESEARCH INST OF INFECTIOUS DISEASES FORT DETRICK MD](#)

Full Text The virulence of Bacillus anthracis has been attributed to a tripartite toxin composed of three proteins designated protective antigen (PA), lethal factor (LF), and edema factor (EF). The effects of the toxin components on human PMN phagocytosis and oxidative metabolism, as measured by **chemiluminescence** (CL), were studied in vitro. Initially, it was determined that the avirulent Sterne strain of B. anthracis (radiation killed) required opsonization with either serum complement or antibodies against Sterne cell wall in order to be phagocytized. Phagocytosis of the opsonized Sterne cells was not ...

Thermochemiluminescent Assay of Porcine, Rat, and Human Erythrocytes for Antioxidative

1984 7 pages

Deficiencies

Authors: [J. L. Kiel](#); [D. N. Erwin](#); [SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TX](#)

Full Text The thermal induction of **chemiluminescence** of luminol-horseradish peroxidase-labeled erythrocytes from pigs, rats, and man was studied. The luminescent responses of rat, porcine, and human erythrocytes to heating were linear in respect to logs of counts per minute versus temperature. Landrace-Duroc crossbred pigs with a history of malignant hyperthermia (porcine stress syndrome) and Poland-China miniature pigs inbred for malignant hyperthermia (MH) yielded erythrocytes with high-level thermochemiluminescence (TCL). Sprague-Dawley rat erythrocytes were intermediate in their production of TCL. ...

Measurement of Rate Constants of Elementary Gas Reactions of Importance to Upper Atmosphere and Combustion Systems

May 10, 1985 12 pages

Authors: [Frederick Kaufman](#); [PITTSBURGH UNIV PA DEPT OF CHEMISTRY](#)

Full Text The vibrational energy transfer of highly excited HCl and HF was studied by the infrared **chemiluminescence** method in a series of five papers. HCl($v=5$) even though the relaxation rate constant rises as v to the 2.7 power. A versatile flow reactor system was built that features three detection methods (laser-induced fluorescence, vacuum u.v. resonance fluorescence, and modulated molecular beam mass spectrometry) plus upstream radical production by IR laser multiphoton decomposition. The $\text{NH}_2 + \text{NO}$ and $\text{CH}_3\text{O} + \text{NO}_2$ reactions were studied successfully. The latter was found to have a recombination (...

The Determination of the Spacecraft Contamination Environment

Oct 1987 384 pages

Authors: [B. D. Green](#); [W. T. Rawlins](#); [G. E. Caledonia](#); [W. J. Marinelli](#); [C. White](#); [PHYSICAL SCIENCES INC ANDOVER MA](#)

Full Text ... of the data in an attempt to reconcile seemingly contractory observations and provide needed understanding of the variety of unexpected processes occurring above spacecraft surfaces in low-earth orbit. We were able to make contributions to the understanding of the neutral molecular contamination cloud; the modifications of the ionic environment; the optical contamination glow; and the earlier observations of particulates. Keywords: Contamination; Optical environment; Low earth orbit; Spacecraft glow particulates; Space shuttle; **Chemiluminescence**; Space environments; Manned spaceflight. (kt)

Proceedings of the Topical Meeting on the Microphysics of Surfaces, Beams, and Adsorbates (2nd) Held in Sante Fe, New Mexico on 16-18 February 1987

Oct 31, 1987 163 pages

Authors: [Jarus W. Quinn](#); [T. M. Mayer](#); [D. J. Ehrlich](#); [T. J. Chuang](#); [OPTICAL SOCIETY OF AMERICA WASHINGTON D C](#)

Full Text ... Ar(+) ions; Multiphoton induced desorption of positive ions from barium fluoride; Excited atom production by electron and ion bombardment of alkali halides; Selective area deposition of metals using low energy electron beams; Synchrotron radiation-excited chemical-vapor deposition and etching; **Chemiluminescence** from F and XeF₂ etching reaction with silicon; An in situ infrared study on the interaction of oxygen plasmas with Si and fluorine plasmas with SiO₂ surfaces; Ultraviolet-assisted growth of GaAs; Atomic layer growth of GaAs by modulated-continuous-wave laser metal-organic vapor phase ...

Chemical Pump Sources for IF(B)

Jun 1988 91 pages

Authors: [Steven J. Davis](#); [Anne M. Woodward](#); [Lawrence G. Piper](#); [William J. Marinelli](#); [PHYSICAL SCIENCES INC ANDOVER MA](#)

Full Text ... , and both require an intermediate state which is most likely iodine monofluoride. The two models hypothesized and tested are described by: (1) iodine monofluoride reacts with singlet sigma oxygen producing the IF(A) state, this state reacts with singlet delta oxygen producing IF(B), (2) vibrationally hot iodine monofluoride reacts with singlet sigma oxygen to produce the IF(A) this reacts with singlet sigma oxygen and produces IF(B). Keywords: Singlet molecular oxygen; **Chemiluminescence**; Iodine monofluoride; Visible chemical laser; Energy transfer; Bimodal vibrational distribution. (jes)

Solid Propellant Flame Spectroscopy

Aug 1988 229 pages

Authors: [J. T. Edwards](#); [AIR FORCE ASTRONAUTICS LAB EDWARDS AFB CA](#)

Full Text ... propellant flames at pressures from atmospheric to 7 MPa (1000 psi). The propellants involved contained AP and HMX, as well as several other formulations. The molecules studied were OH, CH, NH, and NO, primarily, although other atomic and molecular species were seen in the propellant flames in emission. The primary diagnostic employed was laser-induced fluorescence (LIF), although the **chemiluminescence** (emission) from the propellant flames was also studied. These experiments are continuing. Keywords: Models, Combustion diagnostics, Hydrogen oxygen, Carbon, Nitrogen, Chemical radicals. (aw)

The Kinetics and Dynamics of Iodine Monofluoride Formation in Gas-Phase Collisions

Sep 15, 1988 9 pages

Authors: [J. C. Whitehead](#); [MANCHESTER COLL OF SCIENCE AND TECHNOLOGY \(ENGLAND\) DEPT OF CHEMISTRY](#)

Full Text The production of IF(B) in gas phase collisions of fluorine atoms with various organic and inorganic iodides has been investigated to determine methods of efficient production. The key role of electronically excited iodine

atoms has been identified. Excimer laser photolysis of mixtures of molecular fluorine and organic iodides is shown to yield high pulse intensities of IF(B). Chemical Laser, Iodine Monofluoride, **Chemiluminescence**. (mgm)

[Characterization of Chemical Sources of N₂\(A₃ sigma Summation of sub + u\)](#)

Feb 1989 80 pages

Authors: [Graham Black](#); [SRI INTERNATIONAL MENLO PARK CA](#)

... steps. Laser-induced fluorescence techniques have been used to monitor CN, NCO, and N₂(A₃ sigma u). The resonance-enhanced multiphoton ionization (REMPI) technique was developed for N(2D). During this work, vibrationally excited nitrogen was also characterized by its REMPI signals, and two-photon dissociation of both NO and N₂O were discovered as sources of N(2D). The REMPI technique was then applied to the C₂N₂-O₂ system, in which the presence of N(2d) was demonstrated and its temporal profile measured. Nitrogen, **Chemiluminescence**, Resonance enhanced, Multiphoton ionization technique. (mjm)

Full Text

[Singlet Oxygen and Iodine Monofluoride Collisional Energy Transfer Mechanism](#)

Dec 1989 67 pages

Authors: [Robert T. Mack](#); [AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF ENGINEERING](#)

... researchers have demonstrated that singlet oxygen will efficiently pump IF(X) to the IF(B) state, however the exact mechanism has not been determined. The purpose of this research was twofold. First is to identify IF(B) emission due to pumping by O₂(b) emission intensity as a function of the concentration of the individual reactants. The IF(B) emission spectrum indicates that O₂(b) pumping of IF(X) to the IF(A') state cannot be discounted. Quenching coefficients for IF precursors are presented and compared to literature values. Keywords: iodine monofluoride, **Chemiluminescence**, Theses. (AW)

Full Text

[Mechanisms of Chemical Modulation and Toxicity of the Immune System](#)

Dec 15, 1989 43 pages

Authors: [Melinda J. Tarr](#); [OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS](#)

... interleukin 2 (IL2) activity by suppression of IL2 receptor expression; 2.) Nonspecific stimulation of intracellular ionized calcium levels in lymphocytes; 3.) Interference with activated macrophage suppressive effects (as evidenced by reversal of Corynebacterium parvum-induced immunosuppression, as well as interference with **chemiluminescence** and prostaglandin E₂ production). Other mechanisms for the immunomodulatory effects of UDMH which were ruled out include: 1.) UDMH does not interfere with the production or activity of hydrogen peroxide, a 'normal' endogenous immunosuppressant; 2.) UDMH ...

Full Text

[Reactions of Silane in Active Nitrogen](#)

Jan 29, 1990 125 pages

Authors: [Charles A. DeJoseph Jr](#); [WRIGHT RESEARCH AND DEVELOPMENT CENTER WRIGHT-PATTERSON AFB OH](#)

... in these discharges. To study this neutral chemistry, an experimental program along with a coupled rate equation modeling effort was undertaken of the reactions of silane in discharge-produced 'active nitrogen'. Measurements of silane dissociation produced by 'active nitrogen', spectra of the **chemiluminescence** produced in the reaction, and a rate equation model developed to describe the results are presented. Active nitrogen; Silicon nitride; Nitrogen afterglow; Silanes; SiH₄; Solar cells; Xerographic photoreceptors; Images; Detectors; Microelectronic devices; PECVD; Plasma enhanced chemical ...

Full Text

[Studies of Techniques for Measuring Spaceborne Gaseous Contaminants and Particulates in the Near Field](#)

May 18, 1989 66 pages

Authors: [G. E. Galica](#); [S. A. Rappaport](#); [W. P. Reidy](#); [O. Shepherd](#); [VISIDYNE INC BURLINGTON MA](#)

This report outlines techniques for monitoring the water vapor and particulate contamination in the vicinity of a spacecraft. The water vapor concentration is measured by first dissociating the water vapor with VUV radiation from a krypton flashlamp and then monitoring the intensity of the **chemiluminescence** from the dissociation products. The particle properties are measured by illuminating particles in field of view of an imaging detector with visible radiation from a xenon flashlamp. The number of particles as well as the size and velocity distributions are obtained. This report also ...

Full Text

[A New Instrumental Technique for the Analysis of High Energy Content Fuels](#)

Jul 1990 29 pages

Authors: [Ric Hutte](#); [SIEVERS RESEARCH INC BOULDER CO](#)

The technical effort described herein was directed at determining the feasibility of using the Redox **Chemiluminescence** Detector (RCD) for the selective detection of cycloalkanes and antioxidants in jet fuels. Three catalysts (gold, palladium, and platinum) were prepared and evaluated at several reaction temperatures. The gold catalyst at 300 deg C produced the best selectivity for cycloalkanes (40:1 for hexane and 3:1 for nonane). As temperature was increased, however, the selectivity for cycloalkanes decreased. The palladium and platinum catalysts did not demonstrate adequate selectivity ...

Full Text

[Energy Transfer in Singlet Oxygen and Bromine Monofluoride](#)

Dec 1990 89 pages

Authors: [Barrett F. Lowe](#); [AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH](#)

... (BrF), is currently under study as a potential candidate for a visible chemical laser medium. Previous studies have shown a strong emission from BrF(B₃l(O+)) in the presence of singlet oxygen. While singlet oxygen will pump BrF(X) to BrF(B), the exact mechanism is not known. **Chemiluminescence** observed from BrF(B) excited by oxygen in a gas flowtube was used to study the energy transfer mechanism. The objective of this research was fourfold. First, the pumping process was identified as a 3-Body Mechanism. Second, the observed vibrational distribution clearly showed the population of the BrF ...

Full Text

[NMR Characterization of Products Formed in Diazotizing Mixtures of Luminol and 3-Amino-L-Tyrosine](#)

Aug 25, 1991 39 pages

Authors: [John R. Wright](#); [SOUTHEASTERN OKLAHOMA STATE UNIV DURANT DEPT OF PHYSICAL SCIENCES](#)

... into its subunit structures have been unsuccessful. The polymer, which has been named diazoluminomelanin (DALM) because of a possible relationship to the natural melanins, is of interest because its aqueous solution with alkaline Hydrogen peroxide and bicarbonate ion flashes a transient **chemiluminescence** on being irradiated with an intense pulse of microwave energy. Also, aqueous solutions of DALM serve as substrates for the green heme proteins. The reactions leading to DALM appear to involve chiefly 3-diazonium-L-tyrosine and the 5-diazonium derivative of luminol combined in an intimate solid ...

[Full Text](#)

[Measurement and Interpretation of Contaminant Radiations in the Spacecraft Environment](#)

Jun 28, 1991 117 pages

Authors: [J. L. Kofsky](#); [D. L. Rall](#); [R. B. Sluder](#); [PHOTOMETRICS INC WOBURN MA](#)

... parallel and transverse to the symmetry axis of the exhaust; the surface brightness distributions from the firings to windward are well fit by Gaussians; and the total sterances determined by calibration against known stars were in the approximate ratio 10 (ram) : 5 (perpendicular) : 1 (wake), showing that the kinetic energy of the combustion products plays a major part in exciting **chemiluminescence**. Three orders of magnitude less radiation arose from the spacecraft region than from the much larger volume in which the exhaust interacts, from which the hard body appeared physically separated.

[Full Text](#)

[Shock Enhancement and Control of Hypersonic Combustion](#)

Nov 26, 1991 17 pages

Authors: [Frank E. Marble](#); [CALIFORNIA INST OF TECH PASADENA](#)

... indicated that mixing was more rapid and more complete than reported previously. Preliminary work on the consequence of multiple shocks has been promising. Work began on the interaction of shock induced mixing with shear layers in the GALCIT M = 2.5 supersonic wind tunnel. Experiments concerning the details of combustion in large vortices in the Caltech Unsteady Combustion Facility progressed very well using simultaneous measurements of pressure, shadowgraphy, and **chemiluminescence**. These results reveal a very different ignition mechanism and combustion pattern than had been anticipated.

[Full Text](#)

[Shock Enhancement and Control of Hypersonic Combustion](#)

Jun 18, 1992 21 pages

Authors: [Frank E. Marble](#); [Edward E. Zukoski](#); [CALIFORNIA INST OF TECH PASADENA](#)

Experiments concerning the details of combustion in large vortices in the Caltech Unsteady Combustion Facility, using simultaneous measurements of pressure, shadowgraphy, and **chemiluminescence** are now about 50% complete. The detail of these results document a very different ignition mechanism and combustion pattern than previous experiments have suggested. Shock tube studies of shock enhanced mixing of helium into air, utilizing the Rayleigh scattering technique have been completed. Because of their greater sensitivity in the low concentration range, these measurements are significantly more ...

[Full Text](#)

[The Synthesis of Chemiluminescent Flavoabzymes and Their Use in Metal Ion Detection](#)

Sep 2, 1992 10 pages

Authors: [Thomas C. Bruice](#); [CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY](#)

... antibodies (Mab's); 3rd, one or more of the Mab's must catalyze the given CL reaction; and 4th, the hapten must be modifiable such that the CL Mab's become specific complexers of metal ions. Accomplishment of the 1st objective would provide the first Mab mimic of bioluminescence. Attempts to synthesize a hapten to generate Cl flavoabzymes will be discussed as will progress in the synthesis of a hapten to be used to prepare abzymes to catalyze the CL reaction of H₂O₂ with oxalate esters Monoclonal antibodies (Mab's); Abzymes; hapten; antigen; **chemiluminescence** (CL); bioluminescence.

[Full Text](#)

[NMR Characterization of Polymers Formed in Diazotizing Mixtures of Luminol and 3-Amino-L-tyrosine](#)

May 24, 1993 52 pages

Authors: [John R. Wright](#); [SOUTHEASTERN OKLAHOMA STATE UNIV DURANT DEPT OF PHYSICAL SCIENCES](#)

... a month (the polymer forms slowly in the solid residue) . An aqueous solution containing 0.50 F NaOH, 0.0011 M luminol, 0.010 F potassium formate and the polymer at a concentration of 0.050 mg/mL was observed to undergo an instantaneous seven-fold increase of **chemiluminescence** when the solution was subjected to a 0.5 Watt/mL irradiation with 20 kHz acoustic energy. This sonochemiluminescent property suggests that earlier reports of strobos of luminescence induced by pulsed microwave irradiations of aqueous solutions of the polymer might have an origin in the microwave acoustic effect. Since ...

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[The Synthesis of Chemiluminescent Flavoabzymes and Their Use in Metal Ion Detection](#)

Sep 15, 1992 9 pages

Authors: [Thomas C. Bruice](#); [CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY](#)

... antibodies (Mab's); 3rd, one or more of the Mab's must catalyze the given CL reaction; and 4th, the hapten must be modifiable such that the CL Mab's become specific complexers of metal ions. Accomplishment of the 1st objective would provide the first Mab mimic of bioluminescence. Attempts to synthesize a hapten to generate Cl flavoabzymes will be discussed as will progress in the synthesis of a hapten to be used to prepare abzymes to catalyze the CL reaction of H₂O₂ with oxalate esters. Monoclonal antibodies (Mab's), Abzymes, hapten, Antigen, **Chemiluminescence** (CL), Bioluminescence.

[Full Text](#)

[Immunotoxicological Assays Using the Japanese Medaka](#)

Jul 31, 1992 64 pages

Authors: [Robert S. Anderson](#); [Lisa L. Brubacher](#); [MARYLAND UNIV SOLOMONS CHESAPEAKE BIOLOGY LAB](#)

... in oxyradical production by macrophages. In this way, it was possible to provide evidence of immunotoxicity of several classes of common aquatic pollutants such as heavy metals and halogenated phenolic compounds. For example, the priority pollutant pentachlorophenol, an environmentally ubiquitous chemical, was shown to markedly reduce oxyradical production by the blood cells of both oysters and fish. Some of the tests developed

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during this study, especially luminol-augmented **chemiluminescence**, proved to be very sensitive and may find application in monitoring chronic aquatic pollution

[Thermochemical IR Sources: COCHISE and FACELIF Experiments](#)

Mar 14, 1994 39 pages

Authors: [S. M. Miller](#); [W. A. Blumberg](#); [W. T. Rawlins](#); [M. E. Fraser](#); [C. P. Fell](#); [PHILLIPS LAB HANSCOM AFB MA](#)

... and SHARC, where they provide a solid experimental footing for modeling the complex chemical system of the upper atmosphere. The following papers provide the details of these experiments. (a) Branching Ratios for Infrared Vibrational Emission from NO(X2P_{1/2}, v'=2-13) (b) Ro-vibrational Excitation of Carbon Monoxide by Energy Transfer from Metastable Nitrogen (c) Quenching of N (2D) by O(3P) (d) Detection of N(4S) by Resonantly Enhanced Multi-photon Ionization Spectroscopy COCHISE, FACELIF, **Chemiluminescence**, Ro-vibrational excitation multi-photon ionization, NO, CO, N(2D), O, N(4S), Quenching.

[Full Text](#)

[Developments in Laser-Based Diagnostics for Wind Tunnels in the Aeromechanics Division: 1987-1992](#)

May 1994 107 pages

Authors: [Linda G. Smith](#); [Mark S. Maurice](#); [Charles Tyler](#); [John D. Schmisser](#); [George L. Seibert](#); [WRIGHT LAB WRIGHT-PATTERSON AFB OH](#)

The Aero-Diagnostics Research Section of the Aeromechanics Division develops and advances laser-based diagnostic techniques for use in a variety of subsonic through hypersonic wind tunnel facilities. These include laser velocimetry, laser induced fluorescence, Rayleigh scattering, phase shift holographic interferometry, and **chemiluminescence**. The purpose of this report is to bring the reader up to date on the status of these and other techniques under development in the Aeromechanics Division at the Wright Laboratory

[Full Text](#)

[Thermal Dissociation of Halogen Azides](#)

Sep 1994 160 pages

Authors: [D. J. Benard](#); [ROCKWELL INTERNATIONAL THOUSAND OAKS CA SCIENCE CENTER](#)

... heating of FN₃/Bi(CH₃)₃ gas mixtures, however, power extraction was highly inefficient due to the low gain provided by the emitter and the short duration of the shock tube experiment. Much higher gain coefficients were obtained by CO₂ laser heating of FN₃/B₂H₆/SF₆ gas mixtures, which produced intense BH(A-x) **chemiluminescence** and lasing at 433 nm in a low volume cavity with a threshold gain of 2.5 %/cm. An improved BH donor was synthesized by reacting B₂H₆ with NH₃ in a heated capillary oven and optical absorption diagnostics were developed for the dark BH(X) and BH(a) states. (Author)

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[Heat Shock- and Alkaline pH-Induced Proteins of Campylobacter jejuni: Characterization and Immunological Properties](#)

Oct 1994 6 pages

Authors: [Y. L. Wu](#); [L. H. Lee](#); [D. M. Rollins](#); [W. M. Ching](#); [NAVAL MEDICAL RESEARCH INST BETHESDA MD](#)

... were released by selective heat shock, alkaline pH treatment, or both. On the basis of N- terminal sequence analysis and immunological cross-reactivity data, the 64- and 10-kDa proteins were the C. jejuni homologs of Escherichia coli GroEL and GroES proteins, respectively. Enhanced **chemiluminescence** Western blotting (immunoblotting) revealed that all four proteins were among the major protein antigens recognized by anti-Campylobacter rabbit serum immunoglobulin G (IgG) and immune rabbit intestinal lavage IgA (secretory IgA). The results of this investigation suggest that the C. jejuni 10-, ...

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[Acute and Repeated Dose Inhalation Toxicity Effects of Pyrotechnically Disseminated Terephthalic Acid Smoke \(XM83 Grenade\)](#)

Sep 1995 28 pages

Authors: [William T. Muse Jr.](#); [J. S. Anthony](#); [Jeffrey D. Bergmann](#); [David C. Burnett](#); [Charles L. Crouse](#); [EDGEWOOD RESEARCH DEVELOPMENT AND ENGINEERING CENTER ABERDEEN PROVING GROUND MD](#)

... products. Acute exposure levels ranged from 150 - 1900 mg/m³ for 30 min; repeated dose exposures ranged from 128 - 1,965 mg/m³ for 30 min/day for 5 days. Exposed and control Fisher 344 rats were evaluated for toxic signs, bronchoalveolar lavage (BAL), cellular **chemiluminescence** (CL), and histopathologic changes. During exposure, rats exhibited slight to moderate lacrimation, rhinorrhea, lethargy, and dyspnea, which reversed within 1-hr post-exposure. No deaths occurred, even at highest smoke concentrations. Other than a temporary increase in white blood cell count, all BAL and CL ...

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[Optical Contamination and Signatures in the Near-Space Environment](#)

Sep 30, 1996 113 pages

Authors: [J. A. Gardner](#); [D. L. Rall](#); [J. L. Kofsky](#); [PHOTOMETRICS INC WOBURN MA](#)

... motors (which DoD vehicles also use), and H₂O evaporated from its surfaces and/or released in bulk in connection with housekeeping. The emissions, which as scene foregrounds hinder and as targets assist surveillance, include electronic and vibrational bands of these species and **chemiluminescence** from their reactions with the low-density atmosphere; in addition the nearby gases attenuate atmospheric and astronomical radiations. Data on these glows were obtained from both onboard and a mountaintop station (the Air Force Maui Optical Site) by the 'GLO' multichannel imaging spectrograph, several ...

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[\(AASERT-93\) Turbulent Reacting Flows at High Speed](#)

Sep 30, 1996 22 pages

Authors: [Alexander J. Smits](#); [Frederick L. Dryer](#); [J. Fielding](#); [PRINCETON UNIV NJ](#)

... Through the addition of hydrogen in the upstream settling chamber, the effective operating stagnation temperature in the test section was extended to 1100 K. The tunnel facility was instrumented with a Schlieren/shadowgraph system and charge-coupled device (CCD) intensified imaging of **chemiluminescence** from excited state hydroxyl radicals to study the initiation and combustion properties of nitrogen-diluted hydrogen/oxygen mixtures under Mach 3.0 flow conditions over both flat plate and wedge-shaped center bodies. Reaction initiation by recovery effects on noncatalytic and catalytic surfaces, ...

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[Chemiluminescent Substrates for Acetylcholinesterase and Alkaline Phosphatase](#)Feb 28,
1997 28 pagesAuthors: [A. P. Schaap](#); [WAYNE STATE UNIV DETROIT MI DEPT OF CHEMISTRY](#)**Full Text**

The primary objective of this research was to develop thermally stable dioxetanes which could be chemically and enzymatically triggered to provide efficient **chemiluminescence** in aqueous solution.

[Modeling CW DF and HF Laser Performance at Low Cavity Pressures and Diluent Conditions](#)Nov 2,
1978 41 pagesAuthors: [W. L. Rushmore](#); [S. W. Zelazny](#); [BELL AEROSPACE TEXTRON BUFFALO NY](#)**Full Text**

... lower pressure and diluent operating regime. The different class of laser nozzle geometries used in low diluent applications are described and a method for theoretically modeling the internal flow area expansion which occurs in these designs is presented. Experimental data (closed cavity power, **chemiluminescence**, zero power gain) for helium diluent hydrogen fluoride and nitrogen diluent deuterium fluoride chemical lasers is used to assess the accuracy of the model. Agreement between theory and data is good for both the axisymmetric and two dimensional nozzle geometries examined. Test ...

[Weak Interactions of Boron Aluminum, and Carbon Atoms: Experiment](#)Dec 12,
1998 16 pagesAuthors: [Paul J. Dagdigan](#); [JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF CHEMISTRY](#)**Full Text**

... in conjunction with collaborative theoretical work by Millard Alexander, at the University of Maryland Fluorescence excitation and depletion spectra of weakly bound complexes involving the boron atom have been observed and used to deduce the relevant interaction potentials. The aluminum-neon interaction has also been probed in this way. Chemical reaction within the electronically excited boron-hydrogen complex has been probed through observation of the **chemiluminescence** of the BH product A first extension to the study of larger complexes has been made with the observation of the BAr₂ complex.

[Student Research in Rocket and Plume-Reaction Kinetics](#)

Oct 1998 3 pages

Authors: [Arthur Fontijn](#); [RENSELAER POLYTECHNIC INST TROY NY DEPT OF CHEMICAL ENGINEERING](#)**Full Text**

... interaction (SECI) theory has been extended to predict activation barriers for combustion reactions of boron group halide oxidation reactions, Good agreement with experiments has been obtained. Rate coefficients for BO oxidation reactions have been measured. It is shown that these reactions, as well as their AIO equivalents, proceed through formation of intermediate complexes. The CO Fourth Positive System **chemiluminescence** in the vacuum ultraviolet has been studied in two reaction systems: O + C₂H₂ and C₂ + O₂. The latter is shown to be more likely responsible for rocket plume emissions.

[Integrated Instrumentation System for the Development of Ionic Polarized Polymer Light-Emitting Diodes](#)May 5,
1999 7 pagesAuthors: [Yang Yang](#); [CALIFORNIA UNIV LOS ANGELES DEPT OF MATERIALS SCIENCE AND ENGINEERING](#)**Full Text**

A major discovery of the polymer solution light-emitting device (SLED) was uncovered when studying the metal/polymer interfaces. An attempt to improve the device contact by adding solvents on top of polymer film and subsequently placing a metal contact above it. when biased, the device illuminated while the polymer film was still wet. That mechanism of this new type of device is still unclear, however its suspected that this unique device operates by an electro-generated **chemiluminescence** mechanism.

[Hybridization Oven for Research Exploring Molecular Changes in Cells Exposed to Microwave Radiation](#)Dec 24,
1999 2 pagesAuthors: [Martin Meltz](#); [TEXAS UNIV HEALTH SCIENCE CENTER AT SANANTONIO DEPT OF RADIOLOGY](#)**Full Text**

Normal human monocytes exposed to pulsed wave 2.45 GHz RFR for a continuous period of 90 minutes were analyzed for genes that are involved in double strand break-repair and mis-match repair. The hybridization chamber was used to successfully carry out the RNase protection assay. In addition, MM-6 cells exposed to the pulsed wave 2.45GHz RFR for a continuous period of 90 minutes was used to characterize the subunit composition of nuclear factor-κB. The hybridization chamber was used to successfully perform the Immunoblotting and Enhanced **Chemiluminescence** detection of expressed proteins.

[16 K Prolactin as an Angiogenic Inhibitor in Breast Cancer](#)

Jun 2000 11 pages

Authors: [Karen Liby](#); [Nira Ben-Jonathan](#); [CINCINNATI UNIV OH](#)**Full Text**

... , but its role in breast cancer is unclear. Its N-terminal 16K fragment suppresses endothelial cell proliferation in vitro, but its ability to inhibit tumor growth has not been tested. Highly specific antibodies against hPRL were generated and used to develop a novel dot blot/**chemiluminescence** assay to rapidly measure PRL. Baculovirus expression vectors encoding 16K or 23K hPRL were transfected into insect cells, and PRL secretion verified by Western blotting. Partially purified recombinant 16K hPRL inhibited proliferation of bovine aortic endothelial cells in a dose-dependent manner, while ...

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50 

