TANTALUM AND ZIRCONIUM ELECTRODES

Authors: G. Bianchi; G. Caprioglio; MILAN UNIV (ITALY)

The cathodic reduction of O and H2O2 on Al, Ta, and Zr was studied by means of a polarization cell and an electronic potentiostat. Al, Ta and Zr, although covered by an oxide layer, acted as CATHODE FOR THE PROCESSES OF O and H2O2 reduction. Overvoltages and the polarization curves are listed. The results obtained on these 3 metals are compared with those previously obtained on Ti. Overvoltages for cathodic reduction of O decrease in the following order: Zr, Ta, Ti for acid; Al, Ta, Zr, Ti for neutral; and Zr, Ti, Ta for alkaline solutions. These results indicate that the dangers of...

SYNTHESIS AND PYROLYSIS OF METAL ALKOXIDES AS POTENTIAL REFRUCTORY OXIDE COATINGS FOR GRAPHITE

Authors: K.S. Mazdiyasni; C.T. Lynch; DIRECTORATE OF MATERIALS AND EXPLOSIVES RESEARCH AND DEVELOPMENT (GT BRIT)

...tests to establish the materials least subject to attack by cesium, including emitter materials (tungsten, molybdenum, platinum), structural materials (nickel, stainless steel), electrical conductors (copper), and electrical insulators (aluminum oxide); (7) investigation of emitter heating techniques, with tests of an inductive technique (no internal connections) and of a direct heating technique; and (8) elimination of fuel handling problems.

INTERACTION OF PROJECTILES AND COMPOSITE ARMOR

Authors: A. L. Florence; T. J. Ahrens; STANFORD RESEARCH INST MENLO PARK CA

...fields in the facing plate during the initial stages of impact and to determine deflections and bending moments during the later stages. In addition to this work on the mechanics of projectile-armor interaction, exploratory experiments were undertaken with a view toward establishing the dynamic mechanical properties of aluminum oxide, an important facing material.

DEVELOPMENT AND EVALUATION OF TRANSPARENT ALUMINUM OXIDE

Authors: William H. Rhodes; DAVID J. SELLEERS; Arthur H. Heuer; Thomas Vasilos; AVCO MISSILES SPACE AND ELECTRONICS GROUP LOWELL MA AVCO SPACE SYSTEMS DIV

Polycrystalline alumina (A2O3) possessing high total and in-line transmission in the visible range was prepared successfully by a combined high temperature hot forging and annealing operation. Transparency was found to be produced by a combination of several pore removal mechanisms active during deformation and primary recrystallization. A strong basal texture normal to the pressing direction was found for both deformation and recrystallization structures, and the high in-line transmission characteristics were thought to be due to a lowering of birefringent scattering because of this texture...

FRACOGRAPHIC AND THERMAL ANALYSES OF SHOCKED ALUMINA

Authors: H. Palmour III; C. H. Kim; D. R. Johnson; C. E. Zimmer; NORTH CAROLINA STATE UNIV AT RALEIGH

...been examined for evidences of residual strain and annealable excess energy. The findings produced many mutually supporting evidences of local plastic deformation and energy absorption associated with fracture processes in aluminum oxide ceramics and sapphire single crystals. Microscopic evidences from replication facography, and particularly from direct transmission electron microscopy, strongly support the concept of localized plastic deformation processes associated...
Ceramic Materials in Rolling Contact Bearings
Authors: William M. Wheldon, H. Robert Baumgartner, David V. Sundberg, Maurice L. Torti
INDUSTRIAL CERAMICS DIV

The contract for investigation of ceramic materials in rolling contact bearings, was carried out with high strength silicon nitride, silicon carbide and aluminum oxide. Screening rolling contact fatigue testing on silicon nitride with conventional lubricants showed excellent life, greater than M50 steel, at comparable load. The friction and wear properties were determined for silicon nitride, silicon carbide and steel. The coefficient of friction and wear rates are nearly the same for steel-steel and steel-silicon nitride combinations.

Electrophoresis of Colloidal Biological Particles
Authors: John F. Lemm Jr., Eugene A. Asbury, Edward O. Ridgeway
FORT DETRICK FREDERICK MD

... the same kind of biological particles is uniform in a constant environment. The microscope electrophoresis techniques for mobility and isoelectric point determinations of microscopic particles (bacteria, suspended mammalian tissue cells, aluminum oxide particles, and polystyrene latex particles) and submicroscopic particles (proteins and gelatin) are described. The information that can be obtained and the additives for modification of electrophoretic ...

Surface Cleaning by Glow Discharge in High-Volume Gas Flow
Authors: James P. Weston, William W. Balwans
NAVAL RESEARCH LAB WASHINGTON D.C

... with the cleaned surface. The liquids used are triply distilled water for detecting by hydrophobic contamination and methylene iodide for detecting water crate contamination. The surfaces used to demonstrate the cleaning technique were stainless steel and aluminum oxide. Some of the contact angles were too flat to observe but were estimated to be less than 1 degree. The small contact angles are interpreted to mean that there is less than 1 ...

Studies of the Exhaust Products from Solid Propellant Rocket Motors
Authors: R. Dawbarn, M. Kinslow
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AFS TN

... to determine the feasibility of conducting environmental chamber tests on the physical processes which occur when a solid rocket motor exhaust mixes with the ambient atmosphere. Of particular interest was the interaction between hydrogen chloride, aluminum oxide, and water vapor. The program consisted of three phases: (1) building a small rocket motor and using it to provide the exhaust species in a controlled environment; (2) evaluating instruments used to detect and ...

Determination of Effects of Designated Pollutants on Plant Species
Authors: A. L. Granett, O. C. Taylor
CALIFORNIA UNIV RIVERSIDE AIR POLLUTION RESEARCH CENTER

... Vandenberg Air Force Base and were grown in greenhouses equipped with evaporative coolers with activated charcoal air filters. The missile products investigated were hydrogen chloride and hydrogen fluoride gases and aluminum oxide aerosols, alone and in various combinations of toxicants. The gases were generated by the volatilization of acid liquids into a hot air stream and the aerosols were generated using nitrogen gas to carry the particles ...

Effect of Designated Pollutants on Plants
Authors: A. L. Granett, O. C. Taylor
CALIFORNIA UNIV IRVINE

The phytotoxicity of hydrogen chloride (HCl) gas and aluminum oxide (A12O3) particulates was studied in special plant exposure chambers. Seedlings watered with a salt-enriched (850 ppm NaCl) nutrient solution were more tolerant to damage from HCl then when controls. Seeds germinated after exposure to HCl had reduced seedling lengths compared to controls although germination was not affected. A12O3 alone was not toxic under present test conditions and there was no significant change in plant damage by A12O3 + HCl damage alone. Damage ...

The Effects of Designated Pollutants on Plants
Authors: A. L. Granett, O. C. Taylor
CALIFORNIA UNIV IRVINE

... and methylene iodide for detecting water contamination. The surfaces used to demonstrate the cleaning technique were stainless steel and aluminum oxide. Some of the contact angles were too flat to observe but were estimated to be less than 1 degree. The small contact angles are interpreted to mean that there is less than 1 ...

Lubrication with Naturally Occurring Double Oxide Films
Authors: M. B. Petterson, S. J. Calabrese, B. Slupp
WEAR SCIENCES INC ARNOLD MD

A study was conducted to evaluate the lubrication characteristics of double oxides which could occur naturally on high temperature bearing materials. Consideration was given to the double oxides of iron, nickel, cobalt, rhenium, osmium, molybdenum, tungsten, vanadium, chromium, copper, titanium, aluminum, boron, and niobium. A survey was conducted to obtain property data on such compounds and a number selected for evaluation. Primary consideration was given to the rhenates, molybdates, vanadates, borates, osmoniates, and chromates. Friction tests were run over the temperature range 26 to 650C ...

STS-5 (Space Transport System-5) Fish Kill, Kennedy Space Center, Florida
Authors: Joseph E. Milligan, Gene B. Hubbard
AIR FORCE OCCUPATIONAL AND ENVIRONMENTAL HEALTH LAB BROOKS AFB TX

http://www.stormingmedia.us/search.php?q=Aluminum+Oxide&search_x=11&search_y=... 4/30/2010
... on-site investigation of any possible fish kill associated with STS-5 on 11 November 1982. Due to the acuteness of the fish kills and close association with time of launch, STS exhaust products, such as HC1 and/or aluminum oxide were suspected as the cause. Other potential causes considered included diseases, parasites, mechanical interference with respiration, insufficient oxygen, trauma, temperature and pH changes, and exposure to other toxic substances. The conclusion was ...

Environmental Effects in Niobium Base Alloys and Other Selected Intermetallic Compounds

Authors: G. H. Meier; A. W. Thompson; PITTSBURGH UNIV PA DEPT OF MATERIALS SCIENCE AND ENGINEERING

... niobium alloys and other selected intermetallic compounds. This program consists of two parts. The investigations involving oxygen are directed toward describing the conditions which must be achieved in order to have a continuous, protective Aluminum Oxide or Silicon dioxide scale developed on niobium-base alloys and compounds, and other selected intermetallics, at temperatures between 600 and 1400 C. The studies concerned with hydrogen effects are directed toward ...

Alternative Test Methodology for Ballistic Performance Ranking of Armor Ceramics

Authors: Patrick Woolsey; David Kokitko; Stephen A. Mariano; ARMY LAB COMMAND WATERTOWN MA MATERIAL TECHNOLOGY LAB

... producing no residual penetration, a ballistic performance map for the ceramic is generated. Different materials can be compared on the basis of residual penetration observed for a given areal density. Ceramics tested to date include aluminum oxide in 90% and high purity forms, titanium diboride, silicon carbide, and boron carbide. Performance rankings observed for these materials are in agreement with the rankings yielded by conventional V50 protection ballistic ...

Fractographic Analysis of Long Rod Penetrator-Armor Ceramic Interactions

Authors: Michael J. Slavin; ARMY LAB COMMAND WATERTOWN MA MATERIAL TECHNOLOGY LAB

... for these heavy threats. A program was initiated to evaluate the fracture of a ceramic target when impacted by a tungsten long-rod penetrator (LRP). Following a conventional V50 test of a silicon carbide whisker-reinforced aluminum oxide, one target was serial sectioned from the rear. Very fine comminuted ceramic was painstakingly removed from the exit point of the LRP. Tungsten and steel particles were included in the ceramic powder.

Keywords: Armor; ...

Flow Induced Nutation Instability in Spinning Solid Propellant Rockets

Authors: G. A. Flandro; M. Leouloudis; R. Roach; SCIENCE APPLICATIONS INTERNATIONAL CORP LOS ANGELES CA

... PAM-D disturbing torque with most eliminated by failure to comply with telemetry data. Two mechanisms still remain to be more fully evaluated. One is the slag sloshing hypothesis, which links the instability to sloshing of accumulations of aluminum oxide slag within the aft closure of the rocket motor combustion chamber. This mechanism is preferred because it is similar to the familiar liquid stores sloshing nutation source with the driving mechanism linked to the mass ...

Dynamic Behavior of Ceramic Composites

Authors: A. S. Kobayashi; M. Taya; UNIV OF WASHINGTON SEATTLE DEPT OF MECHANICAL ENGINEERING

... dynamic fracture of ceramics and ceramic matrix composites are summarized in this final report. One of the most significant accomplishments was to quantify, for the first time, the energy dissipation rate in the brittle silicon carbonsub w)/aluminum oxide ceramic matrix composite (CMC) using moire interferometry together with finite element analysis. The same hybrid experimental-numerical analysis was also used to determine the resistance curve, which compared favorably with ...

From Minerals to Materials: A Facile Synthetic Route to Preceramic Polymers for Aluminum Oxide

Authors: Allen W. Applett; Christopher C. Landry; Mark W. Mason; Andrew R. Barton; HARVARD UNIV CAMBRIDGE MA DEPT OF CHEMISTRY

... Reaction of boehmite, (Al(O)(OH)n, with an excess of carboxylic acid (HO2CR) results in the formation of the carboxy substituted alumoxanes, (Al(O)(OH)y(O2CR)z)n where 2x + y + z = 3 and R = alkyl substituents. The alumoxanes have been fully characterized by SEM, elemental analysis, IR and multinuclear NMR spectroscopy. The physical properties of the alumoxanes are highly dependent on the identity of R, and range from insoluble crystalline powders, e.g. R = CH3, to powders which readily form solutions or gels in hydrocarbon solvents, e. g. R = CSH11. All of the alumoxanes decompose under ...


Authors: Shaik Jeelani; Hassan Mahfuz; Anwarul Haque; Sirajus Salekeen; TUSKEGEE UNIV AL MATERIALS RESEARCH LAB

This report describes the progress made during the second year of a two-year program funded by the United States Air Force, Office of Scientific Research, to develop experimental and analytical capability to characterize Ceramic/Ceramic composites at room and elevated temperatures. Composites, Ceramics, Silicon Carbide, Aluminum Oxide, Flexure, Fracture.

Thin-Film Permanent Magnets for Integrated Electromagnetic Components

Authors: David Barron; ARMY RES RESEARCH 

... producing no residual penetration, a ballistic performance map for the ceramic is generated. Different materials can be compared on the basis of residual penetration observed for a given areal density. Ceramics tested to date include aluminum oxide in 90% and high purity forms, titanium diboride, silicon carbide, and boron carbide. Performance rankings observed for these materials are in agreement with the rankings yielded by conventional V50 protection ballistic ...
Computer Simulations of Epoxy Adhesive Monomer Interactions with Alumina Surfaces

Aug 1992  26 pages

Emissivity of Rocket Plume Particulates

Sep 1992  44 pages

Fiber Coating by Sputtering for High Temperature Composites

Oct 15, 1992  79 pages

Performance of Reinforced Polymer Ablators Exposed to a Solid Rocket Motor Exhaust

Oct 1992  97 pages

Template Synthesis of Metal Microtubule Ensembles Utilizing Chemical, Electrochemical, and Vacuum Deposition Techniques

Jan 3, 1994  37 pages

Effect of Surface Condition on Strength and Fatigue Behavior of Alumina Ceramic

Nov 1993  90 pages

Template Synthesized Nanoscopic Gold Particles: Optical Spectra and the Effects of Particle Size and Shape

Jan 25, 1994  43 pages

Validation and Implementation of Optical Diagnostics for Particle Sizing in Rocket Motors

Dec 1993  45 pages
Authors: Paul V. Gomes; NAVAL POSTGRADUATE SCHOOL MONTEREY CA

Aluminum oxide (Al2O3) particles of known size distribution were cast into a solid propellant which burned at temperatures less than the melting point of Al2O3. Thus, particles of known size distribution existed at the nozzle inlet and in the plume. Malvern particle sizing instruments were used to make measurements at these two locations using a windowed subscale motor and the results were compared to the known distribution. In the motor, measurements were limited due to disruptive flow from the window purge gas. However, the unaffected larger modes were properly measured. In the plume, ...

Processing and Characterization of Mechanically Alloyed NiAl-Based Alloys

Authors: Marek Dollar; Philip Nash; Stanislaw Dymek; Seung Joon Hwang; Sung-Jae Suh; ILLINOIS INST OF TECH CHICAGO DEPT OF METALLURGICAL AND MATERIALS ENGINEERING

Mechanical alloying of powders followed by hot extrusion has been used to produce NiAl-based materials. The technique is capable of producing fully dense, free of cracks, fine grained materials containing a bimodal distribution of aluminum oxide dispersoids. The mechanically alloyed materials produced in our laboratory are much stronger at both ambient and elevated temperatures and significantly more ductile than their cast counterparts. Minimum creep rates in the MA NiAl are ...

Diagnostic Developments for Velocity and Temperature Measurements in Uni-Element Rocket Environments

Authors: Kenneth D. Philip; AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH

profiles were obtained for firings with a gaseous oxygen (GO2)/gaseous hydrogen (GH2) coaxial shear injector at axial locations of 1.6 mm (0.063 in.), 6.4 mm (0.25 in.), 12.7 mm (0.5 in.), 25.4 mm (1 in.) and 50.8 mm (2 in.).

Investigations of the Ballistic Response of Brittle Materials

Authors: Charles E. Anderson Jr.; James D. Walker; Jim Lankford; SOUTHWEST RESEARCH INST SAN ANTONIO TX

... include experimental testing, numerical simulations, constitutive evaluation, and investigation of fundamental material response to high rate loading. Depth-of-penetration tests with and without cover plates investigated the performance of 99.5% pure aluminum oxide tiles to ballistic impact using L/D 10 tungsten heavy alloy projectiles at two impact velocities, nominally 1.5 and 1.8 km/s. Numerical simulations, using the EPIC95 finite element hydrocode, were ...

Investigations of the Ballistic Response of Brittle Materials

Authors: Charles E. Anderson Jr.; James D. Walker; Jim Lankford; SOUTHWEST RESEARCH INST SAN ANTONIO TX

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Heterogeneous Chemistry in Solid Rocket Motor Plumes

Authors: Peter M. Felker; CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY AND BIOCHEMISTRY

Reaction rates of ozone decomposition and adsorption/desorption rates of HCl on aluminum oxide (alumina) particles were measured by a new technique involving real-time ultraviolet absorption spectroscopy in a static reactor. Reaction probabilities etc are reported for ozone on alpha-alumina, gamma-alumina, and chromatographic alumina (hydroxylated alumina), respectively, over the temperature range -60 to 200 deg C. These measurements expand on previous measurements from this group using a flow tube reactor. ...

Physical Characteristics of Fire-Extinguishing Powders

Authors: Anthony E. Finnerty; Lawrence J. Vande Kieft; Andrew Drysdale; ARMY RESEARCH LAB ABERDEEN PROVING GROUND MD

... dimension1 was defined and applied in order to rank the powders on a size basis. Eleven fire-extinguishing powders and two common commercial powders were examined by both forms of microscopy. The fire-extinguishing grade of aluminum oxide had the smallest average characteristic dimension followed by the 'micronized' sodium bicarbonate samples. These sodium bicarbonate powders appeared to have very little agglomeration of the particles. The large amount of drying agent ...

The Design of Metallic Composites Made From Nickel Aluminide

Authors: S. L. Phoenix; CORNELL UNIV ITHACA NY DEPT OF MATERIALS SCIENCE AND ENGINEERING

The overall objective of this project was to design the microstructure and to test the fracture toughness and creep-rupture properties of metal-matrix composites constructed from NiAl and aluminum oxide. The goal has been to obtain a composite that not only has excellent high temperature creep properties, but also has good fracture toughness at room temperature. Principal microstructural variables have been (i) the crystallographic texture in the metallic phase, ...

Processing of Nanocrystalline Nitrides and Oxide Composites

Authors: Jackie Y. Ying; Martin L. Panchula; MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMICAL ENGINEERING

...
We have examined various synthesis parameters for producing nanocrystalline aluminum nitride and established maps relating surface area and crystallite size to synthesis conditions. Preliminary analysis of the powder compacts and initial sintering studies show a great deal of potential. Green compacts with a very fine average pore size of 5.5 nm were obtained readily. Densities of 96% were achieved without sintering additives after 30 minutes of pressureless sintering at 1900 deg C in flowing nitrogen. We are currently examining sintering behavior at lower temperatures in detail. Future...

Thin Dense Chrome Bearing Insertion Program: Pyrowear 675 and Cronidur Wear Testing

Oct 1998 59 pages
Authors: Michael Johnson; John Lartiz; Mark Rhoads; GE AIRCRAFT ENGINES CINCINNATI OH ADVANCED ENGINEERING TECHNOLOGIES DEPT

... selected subscale and full-scale tests. Subscale tests evaluated the wear characteristics and corrosion resistance. Full-scale tests demonstrated contamination resistance at normal FT10-GE-129 operating conditions with exposure to abnormal aluminum oxide contamination levels. Cronidur 30 demonstrated improved corrosion resistance relative to M50 in salt water and tap water in subscale corrosion testing. Pyrowear 675 also demonstrated improved ...

New Approaches to Understanding and Preventing Corrosion of Aluminum and its Alloys

Apr 25, 2001 3 pages
Authors: Daniel A. Rutty; WYOMING UNIV LARAMIE DEPT OF CHEMISTRY

... in the project is to remove intermetallic inclusions from AA2024 surfaces by chemical etching. The procedure is to expose the surface to an oxidant, such as persulfate, in the presence of complexing agents, such as ethylene diamine (EN) and EDTA. The objective is to have the complexing agents attack the oxide, and facilitate the oxidative removal of noble metals from the intermetallic inclusions. In order to monitor this process, we have developed elemental mapping procedures that allow us to use energy dispersive spectroscopy (EDS) to evaluate the effectiveness of the etching process.

Comparison of Sampler Collection Efficiency Measurements Using a Polydisperse Solid Aerosol and a Monodisperse Liquid Aerosol

Jun 2001 17 pages
Authors: Jana Kesavan; Robert W. Doherty; EDGEWOOD CHEMICAL BIOLOGICAL CENTER ABERDEEN PROVING GROUND MD

... to determine the merits of using a single test of a polydisperse solid aerosol in place of multiple tests of monodisperse liquid aerosols in the characterization of aerosol sampling systems. The polydisperse aerosol chosen was an aluminum oxide (Al2O3) commercial abrasive. Analysis of the Al2O3 particles was by a Coulter Particle Size Analyzer. The monodisperse aerosols were fluorescent oleic acid droplets generated by a vibrating orifice aerosol generator (VOAG) ...

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Characterization of the SCP 1021 Aerosol Sampler

Nov 2001 23 pages
Authors: Jana Kesavan; Robert W. Doherty; EDGEWOOD CHEMICAL BIOLOGICAL CENTER ABERDEEN PROVING GROUND MD

This study characterized the SCP 1021 aerosol sampler (SCP Dynamics, Inc., Minneapolis, MN) at flow rates of 1350 L/min and 1000 L/min. Polydisperse aluminum oxide (Al2O3) particles were used as the solid particles, and the analysis was by Coulter counter. Fluorescent oleic acid particles were used as the monodisperse liquid particles, and the analysis was by fluorometry. The results show that: (1) the sampling efficiency curves for both solid and liquid particles have a peak at ...

Marked Influence of Crystal Structure on the Friction and Wear Characteristics of Cobalt and Cobalt-Base Alloys in Vacuum to 10-8 Millimeter of Mercury and Single Crystal Cobalt

Dec 1964 21 pages
Authors: Donald H. Buckley; Robert L. Johnson; NATIONAL AERONAUTICS AND SPACE ADMINISTRATION CLEVELAND OH LEWIS RESEARCH CENTER

Friction and wear characteristics were determined for polycrystalline Cobalt sliding on various materials (polycrystalline cobalt, 440-C, 5200, and aluminum oxide) in vacuum (10-8 mm Hg). The influence of crystal transformation on the friction and wear characteristics of cobalt were determined by varying sliding velocity and ambient temperature. The effect of orientation of single-crystal cobalt sliding on polycrystalline cobalt was also determined. Friction and wear experiments were ...

Design and Cooling Performance of a Dump-Cooled Rocket Engine

Aug 1966 48 pages
Authors: Albert J. Pavil; Jerome K. Curley; Philip A. Masters; R. M. Schwartz; NATIONAL AERONAUTICS AND SPACE ADMINISTRATION CLEVELAND OH LEWIS RESEARCH CENTER

... thrust rocket engine operating at 100-psig chamber pressure with gaseous hydrogen and liquid oxygen as propellants and liquid hydrogen as a coolant. Fourteen firings were made; of these, the last four were with a refractory coating of aluminum oxide on the flame-side surface. Data showing the measured and analytical heat...
Novel Corrosion Inhibition Methods for Aluminum Surfaces

May 7, 2002 11 pages

Authors: John T. Yates Jr., PITTSBURGH UNIV PA DEPT OF CHEMISTRY

The non-thermal activation of the oxidation of the Al(111) surface has been investigated. It has been found that compared to thermally grown Al2O3 films of equivalent thickness a factor of 10-30 increase in the resistance of oxide films may be achieved by the use of non-thermal activation methods such as electron bombardment of adsorbed water, electron bombardment of adsorbed O2 and Al2O3 clusters, and by oxidation by O3.

Overview Environmental Assessment for the Space Based Infrared System (SBIRS)

Dec 1996 121 pages

Authors: Anthony C. Davis; Donald L. Koehler; J. D. Latimer; Craig McColloch; David S. Reasons; PARSONS ENGINEERING SCIENCE INC AUSTIN TX

... which consist of launch vehicle impacts to the stratospheric ozone layer from rocket exhaust and deorbiting debris; and local impacts, which consist of launch clouds from the launch vehicles that will contain hydrochloric acid and aluminum oxide, electromagnetic radiation from antennas, and local spills from prelaunch activities. The EA evaluated how the Geosynchronous Earth Orbit Satellites and the launch vehicles would affect air quality, water resources, the water supply ...

The Potential for Ozone Depletion in Solid Rocket Motor Plumes by Heterogeneous Chemistry

Aug 1996 22 pages

Authors: M. S. Hanning-Lee; P. M. Felker; J. A. Syage; John J. Lamb; TRW SPACE AND TECHNOLOGY GROUP REDONDO BEACH CA

Rates of ozone decomposition on aluminum oxide (alumina) particles were measured in a flow tube reactor equipped with molecular beam sampling mass spectrometry and ultraviolet absorption spectroscopy, and in a static reaction cell equipped with ultraviolet absorption spectroscopy. Reaction probabilities eta are reported for ozone on alpha-alumina, gamma-alumina, and chromatographic alumina (hydroxylated alumina), respectively, over the temperature range -60 to 200 degrees C. This work addresses the potential for stratospheric ozone depletion by launch ...

Stratospheric Effects of Rocket Exhaust: Heterogeneous Processes

Sep 30, 1999 14 pages

Authors: Mario J. Molina; John R. Edwards; Daniel Pilson; Tyrrel W. Smith Jr.; TRW INC REDONDO BEACH CA ELECTRONICS AND TECHNOLOGY OPERATIONS

The focus of this project has been the laboratory investigation of chemical processes involving the effects of particles emitted by solid rocket motors (SRMs) on stratospheric ozone. Emphasis has been placed on the efficiency of the catalytic chlorine activation process occurring on the surface of aluminum oxide particles.