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Aluminum oxide



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[Electrochemical and Spectroscopic Studies of Molten Halides](#)

Jan 8, 1993

76 pages

Authors: [Gleb Mamantov](#); [TENNESSEE UNIV KNOXVILLE DEPT OF CHEMISTRY](#)

Full Text

... electrochemistry in molten halides, media which are used in the production of several important elements, such as **aluminum**, magnesium and fluorine, in some high energy battery systems, as well as in other applications. The ... avoided is caused by atmospheric contaminants. Even the parent alkali chloroaluminates contain millimolar quantities of complexed **oxide** which may result from the interaction of some melts with Pyrex glass. Therefore, studies of solute species at typical electrochemical or spectroscopic concentrations should take into account the presence of **oxide** species wherever possible.

[Carbonate Treatment of U3O8 Precipitates](#)

Jun 21, 1948

25 pages

Authors: [Gilman Y. Murray](#); [John Dasher](#); [MASSACHUSETTS INST OF TECH CAMBRIDGE MINERAL ENGINEERING LAB](#)

Full Text

... The 803 in the resulting leach solution can then be precipitated with any one of several alkalis such as sodium hydroxide, ammonia, calcium **oxide**, or magnesium **oxide**. A precipitate of most desirable characteristics is obtained by using magnesia as the precipitant, but this precipitate will settle to only 10 per cent ... 25 to 35 per cent water of hydration. The oven-dried product usually contains from 2 to 3 per cent 803, and greater percentages of iron, **aluminum** silicon and magnesium. This cake contains about 150 pounds of water per pound of 803. If dried it would contain 30 pounds of other ...

[Center for Non-Stoichiometric Semiconductors](#)

Sep 2000

68 pages

Authors: [Umesh K. Mishra](#); [CALIFORNIA UNIV SANTA BARBARA DEPT OF ELECTRICAL AND COMPUTER ENGINEERING](#)

Full Text

... (FETs) providing increased breakdown voltages and a reduced noise performance. In recent years the research has been redirected into the newly emerging area of oxides and **oxide** electronics. **Oxide** produced from the steam oxidation of **aluminum** containing semiconductors has found widespread applications in the area of opto-electronics, specifically in vertical cavity lasers. In the research performed under the PRET program, additional applications in electronics, ...

[Applications of New Chemical Heat Sources Phase 1](#)

Jan 2001

66 pages

Authors: [William L. Bell](#); [Robert J. Copeland](#); [Amy L. Shultz](#); [TDA RESEARCH INC WHEAT RIDGE CO](#)

Full Text

... process of elimination, using data on materials costs, reaction rate studies, and calorimetry to measure heat output, we selected the best reactions for ration heaters. The best material: identified are the combination of **aluminum** chloride with calcium **oxide** (AlCl₃/CaO) and diphosphorous pentoxide with calcium **oxide** (P₂O₅/CaO). Either can provide the same heat as the FRH with a small increase in weight, and does not produce any hydrogen. Our overall conclusion ...

[Laser Cladding on Carbon-Carbon Composites](#)

Dec 2002

45 pages

Authors: [John J. Eric](#); [Robert J. Hull](#); [AIR FORCE RESEARCH LAB WRIGHT-PATTERSON AFB OH MATERIALS AND MANUFACTURING DIRECTORATE](#)

Full Text

... it is focused to an approximately 1.3- cm-diameter spot size. Most of the test cases used 6 kW/sq cm to clad the coating material to the substrate surface. Coating materials included powdered **aluminum**, nickel chromium alloy, gray alumina ceramic, and a magnesium **oxide**/ zirconium **oxide** ceramic. Mixed results were obtained, with the alumina providing a slightly better cladding, based on visual appearance and micrographic views.

[Extrusion Based Processing of Ti Alloys: Feasibility Study](#)

Dec 2003

19 pages

Authors: [Joe Cochran](#); [Dave McDowell](#); [Kon J. Lee](#); [GEORGIA INST OF TECH ATLANTA SCHOOL OF MATERIALS SCIENCE AND MECHANICAL ENGINEERING](#)

Full Text

... of this program, honeycombs with square prismatic cells were fabricated by extrusion of titanium **oxide** powder and experiments were conducted to convert the sintered honeycomb to metallic titanium ... These tests focused on kinetics of titanium reduction because high specific surface area **oxide** performs can be fabricated using technology developed by the lightweight structures group at ... reduction studies, dendritic electrodeposition of titanium was observed to be occurring similar to the Hall process for **aluminum**. Thus, a series of tests were conducted to determine if high purity titanium could be ...

[Lightweight, High-Strength, Age-Hardenable Nanoscale Materials](#)

Mar 25, 2004

28 pages

Authors: [Vijay K. Vasudevan](#); [Jainagesh A. Sekhar](#); [CINCINNATI UNIV OH DEPT OF CHEMICAL AND MATERIALS ENGINEERING](#)

[Full Text](#)

Phase transformations and precipitation behavior in age-hardenable nanoscale materials, using binary **aluminum** alloys as model materials, were studied. Nanoparticles of Al-Cu and Al-Zn were synthesized by a plasma ... dia) were found to be supersaturated f.c.c. and were enveloped by a 2-4 nm amorphous Al **oxide** layer. On aging the Al-Cu nanoparticles, a precipitation sequence comprising nearly pure Cu precipitates to theta' to ... the results revealed that Al nanopowders could be processed into bulk structures, leading to interesting Al-Al **oxide** nanocomposites with full densification and high hardness.

[Pulser Laser Deposition of Transparent Conducting Thin Films on Flexible](#)

Jan 19, 2001

21 pages

[Substrates](#)

Authors: [Heungsoo Kim](#); [DEPARTMENT OF THE NAVY WASHINGTON DC](#)

[Full Text](#)

The invention relates to the deposition of transparent conducting thin films, such as transparent conducting oxides (TCO) such as tin doped indium **oxide** (ITO) and **aluminum** doped zinc **oxide** (AZO) on flexible substrates by pulsed laser deposition. The coated substrates are used to construct low cost, lightweight, flexible displays based on organic light emitting diodes (OLEDs).

[Field Effect Controlled Photoresistors Based on Chemically Deposited PbS Films](#)

Jan 2002

6 pages

Authors: [Eugenia Pentia](#); [Lucian Pintilie](#); [Ion Matei](#); [Ioana Pintilie](#); [NATIONAL INST OF MATERIALS PHYSICS BUCHAREST \(ROMANIA\)](#)

[Full Text](#)

... configuration were subsequently deposited by vacuum evaporation on PbS surface (drain and source electrodes). The gate **aluminum** electrode was deposited on the back of the Si substrate. The dependence of the photoconductive signal, generated in the ... (2) The possible variation of the majority carriers (holes) life-time due to the electron blocking at the PbS/**oxide** interface when positive gate voltages are applied on the back electrode. Integrated IR detectors with controlled sensitivity in the 800-3000 nm range can be manufactured at a relatively low cost using the PbS/**oxide**/Si MOS-like structure.

[BERYLLIUM EROSION CORROSION INVESTIGATION FOR SOLID ROCKET](#)

Jun 1967

445 pages

[NOZZLES](#)

Authors: [W. L. Smallwood](#); [PHILCO-FORD CORP NEWPORT BEACH CA SPACE AND RE-ENTRY SYSTEMS DIV](#)

[Full Text](#)

... were tested in 5 designs (100 and 500 pound grains) in 25 tests. **Aluminum** analogs were used in 4 tests. Submerged, conventional and steep inlet nozzles were designed ... nozzle temperatures and ballistic performance were used to determine throat temperature, corrosion and **oxide** deposition histories. Design parameter effects on nozzle and ballistic performance and material failure ... heat transfer, corrosion and deposition analyses. Standard materials can be used with either beryllium or **aluminum** propellants in properly designed motors. Poor nozzle and ballistic performance relates to incomplete metal ...

[CORROSIVE INFLUENCE OF DIPHENYL ON METALS AND OXIDES](#)

Sep 12, 1967

22 pages

[\(KORROZIONNOE VOZDEISTVIE DIFENILA NA METALLY I OKISLY\)](#)

Authors: [Yu. F. Bychkov](#); [I. D. Laptsev](#); [A. N. Rozanov](#); [FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OH](#)

[Full Text](#)

... oxides are subject to the following types of transformations in biphenyl: reduction of oxides and hydroxides to the metal or another **oxide**; formation of hydrides; formation of carbides; and oxidation. Admixture of water to biphenyl in amounts greater than 0.2% was shown to hasten the corrosive failure of **aluminum** A-1 and SAP-1 alloy and lead to intercrystalline corrosion, as well as embrittling and lowering the strength of the metals. Corrosion was also accelerated by sulfur. Admixtures of water do not affect SAP-1 alloy as much as **aluminum** AD-1.

[Reflectance and Emittance of Selected Materials and Coatings](#)

Jan 13, 1975

58 pages

Authors: [Martin Donabedian](#); [AEROSPACE CORP EL SEGUNDO CA ENGINEERING SCIENCE OPERATIONS](#)

[Full Text](#)

... and emittance. Pertinent data which aid in predicting degradation of the solar absorptance in the space environment are also presented. The selected materials include **aluminum** alloy 6061, titanium alloy 6Al-4V, beryllium, various titanium dioxide and zinc **oxide** pigmented (white) coatings, solar cells, optical solar reflectors (second surface mirrors) , using both rigid and flexible substrates, black pigmented coatings, and clear and black anodized **aluminum** coatings.

[Physical and Chemical Characterization of Fog Oil Smoke and Hexachloroethane](#)

Jan 1980

128 pages

[Smoke](#)

Authors: [Sidney Katz](#); [Alan Snelson](#); [Raleigh Farlow](#); [Roger Welker](#); [Stephen Mainer](#); [IIT RESEARCH INST CHICAGO IL](#)

[Full Text](#)

The U.S. Army HC smoke generator has been studied, the investigation including the reagent materials, generation process, and the product gases and aerosol smoke. The reagent material consisted of hexachloroethane, zinc **oxide**, **aluminum**. In a series of chamber tests, variations in material composition did not appear to affect the characteristics of the product smoke, but small variations in the **aluminum** concentration did control the rate of the smoke generating reaction.

[Wettability and Reaction Kinetics in Metal Matrix Composites](#)

Aug 1993

59 pages

Authors: [Glen R. Edwards](#); [David L. Olson](#); [COLORADO SCHOOL OF MINES GOLDEN CENTER FOR WELDING AND JOINING RESEARCH](#)

[Full Text](#)

Research accomplishment during the last academic year are in two related areas: (a) further applications of the thermodynamic model developed in the previous years, and (b) kinetic studies in alumina/reactive metal systems. The ongoing projects are adaptations of the research findings from the previous years, aimed at improving the wettability at an **aluminum**/alumina interface and understanding the nature of the **oxide** barrier formed at the

ceramic/liquid **aluminum** interface.

[Evaluation of Surface Preparation and Application Parameters for Arc- Sprayed](#)

Apr 1999 108 pages

[Metal Coatings](#)

Authors: [Alfred D. Beitelman](#); [CONSTRUCTION ENGINEERING RESEARCH LAB \(ARMY\) CHAMPAIGN IL](#)

[Full Text](#)

The U.S. Army Corps of Engineers uses an 85:15 zinc:**aluminum** alloy coating on hydraulic structures exposed to severe environments, such as those areas on a structure ... the effects of surface preparation and application parameters on the performance characteristics of 85:15 zinc: **aluminum** alloy versus four other materials used for metal coating (metallizing) of Corps structures. These ... of surface preparation and application parameters on adhesion, cavitation, and erosion, and porosity and **oxide** content were investigated, and a statistical analysis of the results was performed. Based upon the ...

[An Evaluation of Application and Surface Preparation Parameters for Thermal](#)

Aug 1999 332 pages

[Spray Coatings](#)

Authors: [Dominic J. Varcalle Jr.](#); [Alfred D. Beitelman](#); [CONSTRUCTION ENGINEERING RESEARCH LAB \(ARMY\) CHAMPAIGN IL](#)

[Full Text](#)

The U.S. Army Corps of Engineers uses thermal sprayed zinc and **aluminum** coatings on hydraulic structures exposed to severe impact and abrasion damage caused by ice and ... An experimental study of the twin wire electric arc (TWEA) spraying of zinc and **aluminum** coatings was conducted to demonstrate the suitability of this technology for Army applications. Experiments on six materials ... tests, and optical metallography. Coating properties were quantified with respect to roughness, hardness, porosity, **oxide** content, bond strength, and microstructure. Coating performance was evaluated and quantified with ...

[Studies of Surface Deactivation of Vibrationally-Excited Homonuclear Molecules in](#)

[Gaseous Discharge Media Using Coherent Anti-Stokes Raman Spectroscopy](#)

Jan 1999 61 pages

[\(CARS\)](#)

Authors: [Perry P. Yaney](#); [John W. Parish](#); [DAYTON UNIV OH](#)

[Full Text](#)

Deactivation coefficients, $\Gamma(v)$, of vibrationally-excited on alloys of **aluminum**, stainless steel alloys, a titanium alloy, gold, Pyrex glass and Teflon were determined from measurements of ... to approximately unity for the AMS 312 stainless steel alloy. The low value for titanium can be attributed to the **oxide** layer. The observed values for gold decreased with increasing temperature consistent with a physical adsorption process. For nearly ... $k(v)$ was proportional to v , or nearly so. Moreover, $\Gamma(v)$ values for neat Pyrex, gold foil and **aluminum** showed similar proportional dependencies on v .

[Low Temperature Polysilicon Thin Film Transistors in Advanced Display](#)

Sep 2000 125 pages

[Technologies](#)

Authors: [Miliadis K. Hatalis](#); [LEHIGH UNIV BETHLEHEM PA](#)

[Full Text](#)

... registers that run at clock frequencies as high as 20 MHz. Finally, several processing issues that were investigated in order to improve the performance of AMOLED displays are described. This includes work on low temperature silicides for TFTs, a novel hillock-free **aluminum** metallization, and the ability of this **aluminum** metallization to form ohmic contacts to indium tin **oxide**.

[Evaluation of Surface Preparation and Application Parameters for Arc- Sprayed](#)

Jul 2001 105 pages

[Metal Coatings](#)

Authors: [Alfred D. Beitelman](#); [William Corbett](#); [ENGINEER RESEARCH AND DEVELOPMENT CENTER CHAMPAIGN IL CONSTRUCTION ENGINEERING RESEARCH LAB](#)

[Full Text](#)

The U.S. Army Corps of Engineers uses an 85:15 zinc:**aluminum** alloy coating on hydraulic structures exposed to severe environments, such as those areas on a structure ... the effects of surface preparation and application parameters on the performance characteristics of 85:15 zinc:**aluminum** alloy versus four other materials used for metal coating (metallizing) of Corps structures. These ... of surface preparation and application parameters on adhesion, cavitation, and erosion, and porosity and **oxide** content were investigated, and a statistical analysis of the results was performed. Based upon the ...

[An Evaluation of Application and Surface Preparation Parameters for Thermal](#)

Nov 2001 313 pages

[Spray Coatings](#)

Authors: [Dominic J. Varcalle Jr.](#); [Alfred D. Beitelman](#); [ENGINEER RESEARCH AND DEVELOPMENT CENTER CHAMPAIGN IL CONSTRUCTION ENGINEERING RESEARCH LAB](#)

[Full Text](#)

The U.S. Army Corps of Engineers uses thermal-sprayed zinc and **aluminum** coatings on hydraulic structures exposed to severe impact and abrasion damage caused by ice and An experimental study of the twin-wire electric arc (TWEA) spraying of zinc and **aluminum** coatings was conducted to demonstrate the suitability of this technology for Army applications. Experiments on six materials ... , and optical metallography. Coating properties were quantified with respect to roughness, hardness, porosity, **oxide** content, bond strength, and microstructure. Coating performance was evaluated and quantified with ...

[Optical Measurements of Air Plasma](#)

May 5, 2008 28 pages

Authors: [Robert J. Vidmar](#); [NEVADA UNIV BOARD OF REGENTS RENO OFFICE OF SPONSORED RESEARCH](#)

[Full Text](#)

... diagnostics. The electron beam originates in a pulsed 100 keV 20-mA source and propagated through a 1/2 - mil **aluminum** transmission window into a 400-liter test cell. Plasma production in air was investigated over the pressure range of ... , resulted in preliminary results using laser-diode absorption spectroscopy to detect water vapor, carbon dioxide, and nitrous **oxide**. A transmission window and sensor to monitor the beam current was

refined from a system that used a 1-mil **aluminum** foil to one with a 1/2-mil foil, which has greatly increased the beam current propagating through the foil into the ...

[BERYLLIUM EROSION CORROSION INVESTIGATION FOR SOLID ROCKET](#)

Nov 1966 385 pages

[NOZZLES](#)

Authors: [W. L. Smallwood](#); [H. L. Moody](#); [J. K. Hall](#); [R. D. Hackett](#); [J. G. Baetz](#); [PHILCO-FORD CORP NEWPORT BEACH CA AERONUTRONIC DIV](#)

... grain pyrolytic graphite. Carbon cloth and asbestos phenolics were used as aft closure, nose cap and entrance cone insulation. Three beryllium formulations and one **aluminum** analog (one test) were used. Pressure, thrust, and thermocouple data are included. Nozzle throat thermal histories and convective heat transfer coefficients were calculated. **Oxide** deposition effects provided extensive thermal insulation and corrosion protection of the nozzle contour. Throat corrosion occurred on only 7 tests. The key grains produced ...

[Full Text](#)

[PRODUCTION DEVELOPMENT OF A SILICON PLANAR EPITAXIAL TRANSISTOR WITH A MAXIMUM OPERATING FAILURE RATE OF 0.001% PER 1000 HOURS AT A CONFIDENCE LEVEL OF 90% AT 25 DEGREES C.](#)

Jul 1, 1963 47 pages

Authors: [MOTOROLA INC PHOENIX ARIZ](#)

... were made in the surface preparation and epitaxial starting material processes. However, work was done on the die bonding and welding processes and these improvements are presented. The most significant changes involve a switch from gold to **aluminum** metalization. Another major process improvement involves the conversion of the base diffusion from boron **oxide** to a boron trichloride process. (Author)

[Full Text](#)

[Translucent Oxides.](#)

Sep 13, 1963 42 pages

Authors: [W. J. Gardner](#); [J. D. McClelland](#); [J. H. Richardson](#); [AEROSPACE CORP EL SEGUNDO CA](#)

Pure **oxide** powders of **aluminum**, beryllium, and magnesium were formed into dense translucent compact bodies by hot pressing. The densities of the bodies were found to be more than 98 percent of the theoretical for the MgO, and more than 99.5 percent for the Al₂O₃ and the BeO. Thermal expansion was measured with a Leitz dilatometer. The data are in agreement with previous published values. Thermal conductivity, modulus of rupture, elastic properties, Young's modulus, shear modulus, dielectric constants, and transmission spectra measurements also are presented. (Author)

[Full Text](#)

[Preparation of Metal-Oxide-Hydroxide Protective Layers under Controlled pO₂-pH₂O-T Conditions.](#)

Jan 25, 1973 15 pages

Authors: [Frank Dachille](#); [E. W. White](#); [Rustum Roy](#); [PENNSYLVANIA STATE UNIV UNIVERSITY PARK MATERIALS RESEARCH LAB](#)

The report briefly summarizes research on work concerned with the preparation of oxidation films on metals under various pO₂, pH₂O, and temperature conditions and the characterization of these films. The thrust of the research was to seek out conditions which would lead to the formation of corrosion resistant **oxide** or hydroxide films. The metals considered for study was narrowed down to **aluminum** and iron, along with titanium, nickel and chromium. The principal method for characterization of the corrosion 'films' are soft x-ray spectroscopy, and x-ray diffraction.

[Full Text](#)

[Laser Damage in Materials](#)

Mar 1974 17 pages

Authors: [Albert Feldman](#); [Deane Horowitz](#); [Roy M. Waxler](#); [NATIONAL BUREAU OF STANDARDS WASHINGTON DC INST FOR MATERIALS RESEARCH](#)

... in materials used in Q-switch solid-state laser systems. In borosilicate crown glass, fused silica, dense flint glass, and yttrium **aluminum** garnet, self-focusing appears to be the main cause of damage. An analysis of damage threshold measurements with linearly polarized radiation and circularly ... phosphate, damage at the lowest levels is caused by inclusions. Bulk and surface damage thresholds in Nd-doped thoria:yttrium **oxide** ceramic are obtained relative to bulk damage thresholds in several optical materials. Relationships under different geometric boundary conditions are also derived for ...

[Full Text](#)

[HALOGEN PASSIVATION STUDIES](#)

Jan 1967 136 pages

Authors: [W. A. Cannon](#); [W. D. English](#); [S. K. Asunmaa](#); [S. M. Toy](#); [N. A. Tiner](#); [DOUGLAS AIRCRAFT CO INC NEWPORT BEACH CA ASTROPOWER LAB](#)

... , the composition of passive films formed, and the deleterious effect of atmospheric moisture on passive surfaces. Fluorination reactions reach completion on stainless steel, nickel and **aluminum** alloy surfaces very rapidly. The surface films formed range from 5 to 20 Å in thickness and grow at the expense of the **oxide** films. The apparent film thickness on copper and Monel surfaces continues to increase slowly over an extended period of time. Exposure of passive films to a humid ...

[Full Text](#)

[A Catalog of Optical Extinction Data for Various Aerosols/Smokes](#)

Jun 1976 83 pages

Authors: [Merrill Milham](#); [EDGEWOOD ARSENAL ABERDEEN PROVING GROUND MD](#)

Extinction spectra in the 3- to 5-, 8- to 13-, and 0.4 to 2.4- micrometer spectral region have been obtained for FS (Chlorosulfonic acid + Free SO₃), red phosphorus, HC (Zinc **oxide**, **Aluminum**, Hexachloroethane), and fog oil smokes. A limited number of theoretical predictions based on Mie theory are also presented and compared with the experimental results. The experimental and computational procedures are described in some detail. These findings are subject to revision; the final report will be published later.

[Full Text](#)

[Silicon Oxynitride Stability](#)

Feb 1987 56 pages

Authors: [Paul G. McMullin](#); [John W. Dzimianski](#); [Jin S. Kim](#); [WESTINGHOUSE DEFENSE AND ELECTRONICS CENTER BALTIMORE MD ADVANCED TECHNOLOGY DIV](#)

... characteristics and important parameters affecting stability or electrical properties. Two types of silicon oxynitride test structures were fabricated. The first type consisted of various size **aluminum** dot capacitors. The second type provided insulated gate field effect transistor with a series of different channel lengths and a group of test capacitors with polysilicon ... with silicon oxynitride gate dielectric. It was concluded from the study that the intrinsic breakdown strength of the nitrided silicon dioxide was about 10 percent greater than that of the thin gate **oxide** prior to nitridation.

[Full Text](#)

[Proceedings of the Conference on the Environmental Chemistry of Hydrazine](#)

[Fuels \(3rd\) Held in Panama City Beach, Florida on 15-17 September 1987](#)

Jan 1988

321 pages

Authors: [Daniel A. Stone](#); [Floyd L. Wiseman](#); [HAZARDOUS MATERIALS TECHNICAL CENTER ROCKVILLE MD](#)

... state does not react with oxygen at atmospheric conditions, but does not react with commonly occurring pollutants, such as ozone, nitrogen oxides, and sulfur oxides. Hydrazine can be oxidized by certain metals and metal oxides, including **aluminum** and cupric **oxide**. Keywords: Hydrazine fuels, Gas phase kinetics, Models, Soil studies, Matrix isolation studies, Disposal studies, Detection, Monitoring, Toxicology. (MJM)

[Full Text](#)

[Low Temperature Deposition and Characterization of N- and P-Type Silicon](#)

[Carbide Thin Films and Associated Ohmic and Schottky Contacts](#)

Dec 1993

50 pages

Authors: [R. F. Davis](#); [R. J. Nemanich](#); [M. C. Benjamin](#); [S. Kern](#); [L. M. Porter](#); [NORTH CAROLINA STATE UNIV AT RALEIGH](#)

... films on SiC wafers and layers. Etching with a solution of 1:1:10HF:H₂: ethanol and a hydrogen plasma sharply reduced both the **oxide** and the C surface concentrations as determined by AES and XPS spectra. Controlled growth of both Beta-SiC and alpha (6H)-SiC films have been achieved ... reaction zone contained Ti₅Si₃ and TiC. The electrical properties changed little as a function of heat treatment. alpha (6H)-SiC, Beta-SiC, **Aluminum** nitride, Thin films, Plasma etching, Surface reconstruction, defects, Schottky contacts, Molecular beam epitaxy, X-ray photoelectron spectroscopy, Auger spectroscopy, ...

[Full Text](#)

[A Comparison of Thin Film Sulfuric Acid Anodizing and Chromic Acid Anodizing](#)

[Processes](#)

Apr 25, 1995

40 pages

Authors: [Stephen M. Cohen](#); [Stephen J. Spadafora](#); [NAVAL AIR WARFARE CENTER AIRCRAFT DIV WARMINSTER PA AIR VEHICLE AND CREW SYST EMS TECHNOLOGY DEPT](#)

Chromic acid anodizing (CAA), a common **aluminum** pretreatment, forms a thick **oxide** film which provides protection against environmental degradation.

[Full Text](#)

[Optical and Photonic Applications of Electroactive and Conducting Polymers](#)

[CHEMISTRY](#)

Mar 1996

9 pages

Authors: [Y. Z. Wang](#); [D. D. Gebler](#); [J. W. Blatchford](#); [S. W. Jessen](#); [L.-b. Lin](#); [OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY](#)

Symmetrically configured AC light emitting (SCALE) devices based on conjugated polymers utilizing indium tin **oxide** (ITO) and **aluminum** as electrodes have been demonstrated recently. Here we report the fabrication of SCALE devices using a more stable high work function metal, such as gold, as a charge (both electron and hole) injection electrode. Also, a variation of such devices in which the electroluminescent polymer, instead of being separated from the insulating polymer, is dispersed in the insulating polymer to ...

[Full Text](#)

[Structure-Property Behavior of Organic-Inorganic Hybrid Materials Based on Sol](#)

[Gel Chemistry](#)

Dec 6, 1996

95 pages

Authors: [Garth L. Wilkes](#); [VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT OF CHEMICAL ENGINEER ING](#)

... principal example being amino propyltrimethoxysilane. It has been demonstrated that the coatings display very good abrasion resistance for polymeric substrates, **aluminum** and copper but do not perform as well on steel or a phosphate coated steel. The final portion of ... inorganics made by the calcination of hybrid organic-inorganic network materials but where these networks were prepared by the use of functionalized polytetramethylene **oxide** oligomers of varied molecular weight that had been reacted with tetraethylorthosilicate (TEOS). It was demonstrated that calcination of these materials could ...

[Full Text](#)

[Organo-Aluminate Polymeric Materials as Advanced Erosion/Corrosion Resistant](#)

[Thin Film Coatings](#)

Mar 19, 1996

32 pages

Authors: [Ronald L. Cook](#); [Andrew R. Barron](#); [James O. Stoffer](#); [Harlan Anderson](#); [TDA RESEARCH INC WHEAT RIDGE CO](#)

... alumoxane-epoxy, alumoxane-urethane and phosphonato-alumoxane precursors that can be used to prepare durable alumoxane based coatings. In this quarters work we have also begun to evaluate alumoxane-epoxy and alumoxane-urethane resins as coatings on **aluminum** substrates. In addition, cerium/molybdenum exchanged alumoxanes were prepared as precursors for the preparation of corrosion resistant **oxide** barrier coatings.

[Full Text](#)

[Characterization of Newly Developed Conductive Composites](#)

[CREW SYSTEMS TECHNOLOGY DIRECTORATE](#)

Mar 1984

34 pages

Authors: [L. J. Buckley](#); [I. Shaffer](#); [R. Trabocco](#); [NAVAL AIR DEVELOPMENT CENTER WARMINSTER PA AIRCRAFT AND CREW SYSTEMS TECHNOLOGY DIRECTORATE](#)

... composites consisting of various thermoplastics filled with conductive chopped fibers have been studied. The thermoplastics chosen were polyphenylene sulfide (PPS), polyetherimide (PEI), polyphenylene **oxide** (PPO), polyamide (Nylon), polycarbonate (PC), and liquid crystalline polyester (LCP). The chopped fibers included graphite (Gr), stainless steel (SS), **aluminum** flake (Al Fl), and nickel coated graphite (NiGr). Drop weight impact and tensile properties were determined. The effect of fiber loading and type ...

[Full Text](#)

[Characterization of Newly Developed Conductive Composites](#)

Mar 1984

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Authors: [L. J. Buckley](#); [I. Shaffer](#); [R. Trabocco](#); [NAVAL AIR DEVELOPMENT CENTER WARMINSTER PA AIRCRAFT AND CREW SYSTEMS TECHNOLOGY DIRECTORATE](#)

Full Text

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[Measurement of Heterogeneous Deactivation of Vibrationally Excited Homonuclear Molecules at Solid Surfaces](#)

Jan 29, 1999

59 pages

Authors: [John W. Parish](#); [Perry P. Yaney](#); [DAYTON UNIV OH DEPT OF PHYSICS](#)

Full Text

Deactivation coefficients, $\gamma(v)$, of vibrationally-excited $N_2X(1) \sigma_g(+),v$ on alloys of **aluminum**, stainless steel alloys, a titanium alloy, gold, Pyrex glass and Teflon were determined from measurements of the wall relaxation rate coefficients for the $v \dots$ for the AMS 4943D alloy of titanium to approximately unity for the AMS 312 stainless steel alloy. The low value for titanium can be attributed to the **oxide** layer. The variation of $k(v)$ with v was linear or nearly linear in all cases with slopes lower in most cases than the rate of increase of the vibrational-translational exchange ...

[Investigations of Novel Surface Modification Techniques for Wear Resistant Al and Mg Based Materials](#)

1994

22 pages

Authors: [Victor Lyubimov](#); [TULA STATE TECHNICAL UNIV \(RUSSIA\) ELECTROPHYSICAL AND ELECTROCHEMICAL LAB](#)

Full Text

This report results from a contract tasking Tula State Technical University as follows: Investigate the development of **oxide**/silicide wear resistant coatings produced by microarc discharge oxidation (MDO) on the surface of **aluminum** and magnesium based alloys.

[Beowulf Cluster for Computational Corrosion and Catalysis Studies](#)

Aug 11, 2002

3 pages

Authors: [Andrew M. Rappe](#); [PENNSYLVANIA UNIV PHILADELPHIA DEPT OF CHEMISTRY](#)

Full Text

... and complex portions of our current contact with AFOSR. The DURIP funding has now provided our personnel with the computational capability to examine the corrosion of **aluminum** alloys, to understand the role of stress fields in materials and in the multi-scale modeling of fatigue and fracture, and to study reactivity on patterned surfaces including superlattice, nanoparticles, and piezoelectric **oxide** supported metal. To perform this research, we will use ab-initio density functional theory (DFT), which gives quantitative results by detailed modeling of ...

[Nanocomposite Diamond and Nitride Films on Structural Materials](#)

May 28, 2001

3 pages

Authors: [Henry W. White](#); [CURATORS OF THE UNIV OF MISSOURI COLUMBIA](#)

Full Text

... 1) A laser absorption wave deposition (LAWD) was constructed to deposit diamond and diamond like films and nitride based films on steel, **aluminum** and other substrates from flowing methane/hydrogen mixtures. A pulsed infrared YAG laser was used to create simultaneously two plasmas from the flowing gas mixture ... a template layer between the Fe-based substrate and the diamond-like film. 3) A pulsed UV krypton-ion laser deposition system was constructed for growth of structured **oxide** films. ZnO films were grown on various substrates. A method for p-type doping of ZnO films was developed for use in ...

[Transport and Storage of Metals in Fractured and Karstic Rock Aquifers](#)

Mar 31, 2003

123 pages

Authors: [William B. White](#); [PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF GEOSCIENCES](#)

Full Text

... movement of metals in karst aquifers, including metal accumulation, release, and transport under low flow and storm conditions. Metals investigated include **aluminum**, arsenic, chromium, lead, and nickel. Measurements were made of variations in metal concentration from base flow to storm flow using three ... coincident with the peak of the storm hydrograph. Trace metals are stored in the spring sediments mainly bound onto iron or manganese **oxide** coatings on the silicate grains. Appendixes contain the following research papers by Dorothy J. Vesper and William B. White: "Storm Pulse Chemographs of ...

[Fundamental Understanding of Propellant/Nozzle Interaction for Rocket Nozzle Erosion Minimization Under Very High Pressure Conditions](#)

Aug 31, 2005

108 pages

Authors: [Kenneth K. Kuo](#); [Kenneth Brezinsky](#); [Sathyanaraya Hanagud](#); [Stephan Irlle](#); [Joseph H. Koo](#); [M. C. Lin](#); [Suresh Menon](#); [John Morral](#); [Jamal Musaev](#); [PENNSYLVANIA STATE UNIV UNIVERSITY PARK](#)

Full Text

... of the W-O-C-H-Cl systems have been obtained to acquire insight into tungsten reaction mechanisms with gaseous mixtures at high-pressure conditions. From equilibrium calculations, tungsten-based nozzles are suitable for aluminized propellants since tungsten **oxide** and tungsten oxychloride formation are significantly reduced due to the strong affinity of oxygen for **aluminum**.

[The SPADES Ship Production and Control \(SPAC\) Module](#)

Jun 1978

45 pages

Authors: [Filippo Cali](#); [NAVAL SURFACE WARFARE CENTER CARDEROCK DIV BETHESDA MD](#)

Full Text

... the burning machine. I feel that the use of this feature is justifiable at the present only when using the burning machine for cutting templates from light gauge sheet metal or **aluminum**, since this operation will represent only a small percentage of the total work load. Total use of it will probably have to wait until better marking systems are available, although some shipyards with surplus N/C cutting capability might find it desirable, even with today's hardware. The zinc **oxide** marker is probably the best tool to use at the present for this purpose.

[Electronic Properties and Device Applications of III-V Compound Semiconductor Native Oxides](#)

Mar 2, 2006 67 pages

Authors: [Douglas C. Hall](#); [Patrick J. Fay](#); [Thomas H. Kosel](#); [Bruce A. Bunker](#); [Russell D. Dupuis](#); [NOTRE DAME UNIV IN DEPT OF ELECTRICAL ENGINEERING](#)

Full Text

Notre Dame has demonstrated the first gallium arsenide (GaAs)-based metal-oxide-semiconductor field-effect-transistor (MOSFET) utilizing a native **oxide** gate dielectric which has excellent microwave frequency performance and, due to its low gate leakage, promises both low-power operation and potential for superior power amplifier devices. We have shown that the wet-thermal native oxides of the compound semiconductor indium **aluminum** phosphide (InAlP) can be scaled to thicknesses required for devices (10- 20 nm) and still maintain their excellent electrical insulating properties and ...

[Investigation of Non-Conventional Bio-Derived Fuels for Hybrid Rocket Motors](#)

Aug 2007 144 pages

Authors: [Scott G. Putnam](#); [AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH GRADUATE SCHOOL OF ENGINEERING AND MANAGEMENT](#)

Full Text

... port geometry and overcomes the main weakness of traditional hybrid rocket motor propellants, which are low regression rates. Beeswax was also tested with nitrous **oxide** as an oxidizer, but further testing is needed to attain high enough combustion chamber pressures to achieve stable combustion. Experimental evaluation of the specific ... of non-conventional hybrid rocket motors This analysis indicates beeswax, lard, a mixture of paraffin and lard, and combinations of beeswax and **aluminum** should all perform better than traditional hybrid rocket propellants considered when burned with oxygen.

[Fabrication and Characterization of Schottky Diodes using Single Wall Carbon Nanotubes](#)

Nov 30, 1999 16 pages

Authors: [Brandon E Luquette](#); [Barbara M Nichols](#); [ARMY RESEARCH LAB ADELPHI MD SENSORS AND ELECTRON DEVICES DIRECTORATE](#)

Full Text

Schottky diodes using single wall carbon nanotubes (SWNTs) were fabricated using palladium and **aluminum** source and drain contacts, respectively. SWNTs were grown on high resistivity silicon substrates with a thermal **oxide** layer using chemical vapor deposition and ferric nitrate catalyst. Multiple cleanroom processing steps were used to make the diodes which included the deposition of marker layers, oxygen plasma etch for selective nanotube ...

Total Results: 197

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