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[Ultrahigh Vacuum Metalorganic Chemical Vapor Deposition and In Situ Characterization of Nanoscale Titanium Dioxide Films](#) May 1994 214 pages

Authors: [Polly W. Chu](#); [CORNELL UNIV ITHACA NY](#)

... method was developed for producing controlled submonolayer depositions from **titanium** isopropoxide precursor. Film thickness ranged ... were analyzed for evidence of interface reaction. Deposition from **titanium** isopropoxide is divided into two regimes: ... temperature was determined to be 300 deg C. Controlled submonolayers of **titanium** oxide were produced by cycles of dosing ... grown by the cycling method were determined to be TiO₂. **Titanium dioxide** film stoichiometry was unaffected by isothermal ... shifts were consistent with oxygen in sapphire and **titanium dioxide** having different O 1s photoelectron peak ...

Full Text

[Rutile Titanium Dioxide and Its Use in Polymer Systems](#) Jan 5, 1989 19 pages

Authors: [Charles R. Hegedus](#); [NAVAL AIR DEVELOPMENT CENTER WARMINSTER PA AIR VEHICLE AND CREW SYSTEMS TECHNOLOGY DEPT](#)

... phase report which presents a literature review on the use of rutile **titanium dioxide** in polymer systems. It is part of an overall project to study the thermodynamics of polymer-pigment interactions and the relationship between these interactions and the bulk properties of organic coatings. **Titanium dioxide** is extensively used as a filler in polymer systems because ... to impart whiteness, opacity, and chemical stability to the resulting composite. The manufacturing process, properties of rutile **titanium dioxide** are reviewed. The properties of composites produced from **titanium** ...

Full Text

[Toxicity and Fate Comparison between Several Brass and Titanium Dioxide Powders](#) Jul 1993 13 pages

Authors: [Mark V. Haley](#); [Carl W. Kurnas](#); [EDGEWOOD RESEARCH DEVELOPMENT AND ENGINEERING CENTER ABERDEEN PROVING GROUND MD](#)

... (MD Both Industries, Ashland, MA), SF-150 Rich Gold, and four brands of **titanium dioxide** were tested to determine their toxicities to Daphnia magna (water flea), Ankistrodesmus falcatus (green algae), and Selenastrum ... in fresh water of varying hardness, in synthetic marine salt water (30 ppt), and in physiological saline solution (9 ppt). The **titanium dioxide** materials were nontoxic to daphnia up to 1000 mg/L. Daphnia were able to ingest **titanium dioxide** and pack the entire gut without showing any apparent effects. Daphnia, Algae, EC50, Aquatic toxicity.

Full Text

[Comparative Inhalation Screen of Titanium Dioxide and Graphite Dusts](#) Nov 1988 224 pages

Authors: [Sandra A. Thomson](#); [Jeffrey D. Bergmann](#); [David C. Burnett](#); [John C. Carpin](#); [Charles L. Crouse](#); [CHEMICAL RESEARCH DEVELOPMENT AND ENGINEERING CENTER ABERDEEN PROVING GROUND MD](#)

... dust by the American Conference of Governmental Industrial Hygienists. Natural graphite is the mineral form of graphitic carbon and contains associated silicate minerals. **Titanium dioxide** is also regarded as a nuisance dust and was used as a negative control in this study. Fischer 344 rats were exposed via whole body inhalation to 100 mg/cu. m of synthetic graphite, natural graphite, and **titanium dioxide** for 4 hr/day for 4 days. At 24 hr and 14 days post-exposure (PE), exposed and air exposed controls were evaluated for bronchoalveolar ...

Full Text

[Acute Inhalation Toxicity Effects of Explosively Disseminated - - XM82 Grenade - - Titanium Dioxide](#) Jun 1992 34 pages

Authors: [Roger J. Hilaski](#); [Jeffrey D. Bergmann](#); [John C. Carpin](#); [William T. Muse Jr](#); [Sandra A. Thomson](#); [CHEMICAL RESEARCH DEVELOPMENT AND ENGINEERING CENTER ABERDEEN PROVING GROUND MD](#)

Titanium dioxide (TiO₂) is the major component for a proposed training smoke grenade (XM82). The American Conference of Governmental Industrial Hygienists has classified TiO₂ as a 'nuisance dust' with threshold limit value of 10 mg/m³ of total dust (<1% ... were submitted for bronchoalveolar lavage, biochemical, physiological, and pathological evaluations at 24-hr and 14-days post exposure. The results indicate there were no irreversible adverse changes in the biological response of the rats exposed to TiO₂ from the XM82 grenade. **Titanium Dioxide** (TiO₂), Inhalation, Dust, XM82 Grenade.

Full Text

[Screening Smoke Performance of Commercially Available Powders. 2. Visible Screening by Titanium Dioxide](#) Jun 1994 28 pages

Authors: [Janon F. Embury](#); [Donald Walker](#); [Curtis J. Zimmermann](#); [EDGEWOOD RESEARCH DEVELOPMENT AND ENGINEERING CENTER ABERDEEN PROVING GROUND MD](#)

[Full Text](#)

The visible and infrared smoke screening performance of a variety of commercially available **titanium dioxide** pigments have been evaluated in the ERDEC 14 cu m smoke chamber. Four performance parameters-extinction coefficient, dissemination yield, particle density and ... for the visible, mid IR and for IR bands as well as 1.06 micrometers wavelength in order to rate their relative screening capabilities. **Titanium dioxide**, Electrostatic aerosol dispersion, Aerosol deposition, Visible screening, Aerosol coagulation

[Energetics of Semiconductor Electrode/Solution Interfaces: EQCM Evidence For Charge-Compensating Cation Adsorption and Intercalation During Accumulation Layer Formation in the Titanium Dioxide/Acetonitrile System](#)

May 31, 1995 15 pages

Authors: [L. A. Lynn](#); [Joseph T. Hupp](#); [NORTHWESTERN UNIV EVANSTON IL DEPT OF CHEMISTRY](#)

[Full Text](#)

Combined reflectance, electrochemical quartz crystal microbalance and conventional voltammetric measurements on high area **titanium dioxide** electrodes in dry, electrolyte-containing solutions of acetonitrile show that electron accumulation layer formation is coupled directly to irreversible intercalation (e.g. Li⁺ or Na⁺ ...). More generally, the charge compensation based adsorption/intercalation phenomenon appears to play a key role in defining the conduction band edge energetics of **titanium dioxide** and presumably other metal. jg

[An Investigation of Adhesive/Adherend and Fiber/Matrix Interactions Part A - Surface Characterization of Titanium Dioxide, Titanium and Titanium 6% Al- 40% V Powders: Interaction with Water, Hydrogen Chloride and Polymers](#)

May 1982 207 pages

Authors: [R. V. Siriwardane](#); [J. P. Wightman](#); [VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT OF CHEMISTRY](#)

[Full Text](#)

... reflectance visible- infrared spectroscopy (6), secondary ion mass spectrometry (7), Auger electron spectroscopy (2,8), and ion scattering spectroscopy (7) have been used to characterize this oxide layer. The surface oxide layer is generally accepted to be **titanium dioxide**. It has been reported that the layer on the Ti 6-4 surface may indeed, be the rutile (8) phase of TiO₂. However, because of its low surface area it is difficult to characterize the oxide ...

[COMBUSTION INSTABILITY OF SOLID PROPELLENTS: EFFECT OF OXIDIZER PARTICLE SIZE, OXIDIZER/FUEL RATIO AND ADDITION OF TITANIUM DIOXIDE TO PLASTIC PROPELLENTS.](#)

May 1968 40 pages

Authors: [R. D. Gould](#); [ROCKET PROPULSION ESTABLISHMENT WESTCOTT \(ENGLAND\)](#)

[Full Text](#)

... tendency to show combustion instability at 1000 psi has been investigated using a T burner. It has been shown that ammonium perchlorate particle size can have a large effect on the acoustic response and that this is frequency-dependent. **Titanium dioxide** is usually added to plastic propellents to promote stable combustion and the mechanism of its action has been determined. With a view to the potential use of oxygen-balanced propellents the effect of varying the oxidizer/fuel ...

[Energetics of Electron Transfer at the Nanocrystalline Titanium Dioxide Semiconductor/Aqueous Solution Interface: pH Invariance of the Metal Based Formal Potential of a Representative Surface Attached Dye Couple](#)

Oct 1996 15 pages

Authors: [Susan G. Yan](#); [Josep T. Hupp](#); [NORTHWESTERN UNIV EVANSTON IL MATERIALS RESEARCH CENTER](#)

[Full Text](#)

Mediator-based spectroelectrochemical assessment of the metal- centered formal potential (E_{sub f}(RU)) of a representative inorganic dye, Ru(4, 4'-(CH₂PO₃)-2,2'-bipyridine)₃ (10⁻), bound to a nanocrystalline **titanium dioxide** film shows that the potential is insensitive to changes in solution pH, despite significant shifts in the conduction band edge energy (E_{sub CB}) of the underlying semiconductor electrode in response to the same environmental ...

[Pulmonary Effects of Pyrotechnically Disseminated Titanium Dioxide Smoke in Rats](#)

May 2007 43 pages

Authors: [J S Anthony](#); [Robert L Kristovich](#); [David A McCaskey](#); [Emily A Davis](#); [Kathy L Matson](#); [David Burnett](#); [Bernardita P Gaviola](#); [Charles L Crouse](#); [Michael S Horsmon](#); [Edgar C Kimmel](#); [SCIENCE APPLICATIONS INTERNATIONAL CORP \(SAIC\) ABINGDON MD](#)

[Full Text](#)

... has been developed within the Family of Tactical Obscuration Devices to fulfill the small through medium area screening obscuration need. After the health hazards were analyzed for the currently used obscurant payloads, **titanium dioxide** (TiO₂) was chosen as the candidate smoke, while maintaining the necessary performance characteristics. Many studies have been performed evaluating the toxicity of inhaled TiO₂; however, most have evaluated long exposure times (i.e., ...

[Optical, Physical, and Chemical Properties of Surface Modified Titanium Dioxide Powders](#)

Feb 2011 48 pages

Authors: [Brendan G DeLacy](#); [David R Redding](#); [Joshua Matthews](#); [JOINT PRODUCT MANAGER RECONNAISSANCE AND PLATFORM INTEGRATION APG MD](#)

[Full Text](#)

Titanium Dioxide (TiO₂) powder is currently used by the U.S. Army as an obscurant fill in the M82 and M106 visible smoke grenades. The U.S. Army previously evaluated a wide range of TiO₂ powders for use in these grenades. However, the chemical and physical properties of these powders were not explored in the context of grenade performance. Therefore, an initial study was undertaken to characterize the chemical, physical, and optical properties of TiO₂ powders that impact its performance in the M106 grenade. A desired outcome of the study is to incorporate the requisite characteristics ...

- [Semiconductor Based Interfacial Electron Transfer Reactivity: Decoupling Kinetics from pH Dependent Band Energetics in a Dye-Sensitized Titanium Dioxide/ Aqueous Solution System](#) Oct 26, 1995 17 pages
- Authors: [Susan G. Yan](#); [Joseph T. Hupp](#); [NORTHWESTERN UNIV EVANSTON IL DEPT OF CHEMISTRY](#)
- Full Text** Hexaphosphonation of Ru(bpy)₃(2+) provides a basis for surface attachment to nanocrystalline TiO₂ in film (electrode) or colloidal form and for subsequent retention of the molecule over an extraordinarily wide pH range. Visible excitation of the surface attached complex leads to rapid injection of an electron into the semiconductor. Return electron transfer, monitored by transient absorbance spectroscopy, is biphasic with a slow component that can be reversibly eliminated by adjusting the potential of the dark electrode to a value close to the conduction band edge (E_{sub} CB). Evaluation of ...
- [National Environmental Technology Test Sites \(NETTS\). Technology Demonstration Application Analysis Report. Titanium Dioxide Photocatalytic Oxidation of Vapors Contaminated with Chlorinated Compounds. Revision No. 1](#) Sep 12, 1997 284 pages
- Authors: [URS GREINER INC SACRAMENTO CA](#)
- Full Text**
- [Titanium Dioxide Photo-Catalyzed Degradation Of Polyurethanes](#) Oct 10, 2006 17 pages
- Authors: [David A. Worsley](#); [WALES UNIV SWANSEA \(UNITED KINGDOM\)](#)
- Full Text** This report results from a contract tasking University of Wales Swansea as follows: This project aims to harness new techniques developed to assess the mechanisms and kinetics of paint failure in short term exposure to the results from traditional weathering experiments. This will enable a rapid test system to be developed for polyurethane coatings which currently are showing premature failures.
- [THE STRESS-CORROSION AND ACCELERATED CRACK-PROPAGATION BEHAVIOR OF TITANIUM AND TITANIUM ALLOY.](#) Feb 1, 1966 30 pages
- Authors: [J. D. Jackson](#); [W. K. Boyd](#); [BATTELLE MEMORIAL INST COLUMBUS OH DEFENSE METALS INFORMATION CENTER](#)
- Full Text** ... the stress-corrosion cracking and crack propagation behavior of titanium alloys in a variety of environments. Much of this information, ... as additional information becomes available. Almost all titanium alloys are susceptible to stress-corrosion cracking at elevated ... three parameters vary significantly among the different titanium alloys. The mechanism of hot-salt stress-corrosion cracking ... titanium dichloride, sodium hydroxide and titanium dioxide. Cyclic exposure from room temperature to test ... silver compounds may cause stress-corrosion cracking of titanium alloys at 700 F and above. A type of ...
- [The Metallurgy of Titanium.](#) Nov 27, 1970 757 pages
- Authors: [V. A. Garmata](#); [B. S. Gulyanitskij](#); [V. Yu. Kramnik](#); [Ya. M. Lipkes](#); [G. V. Seryakov](#); [FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO](#)
- Full Text** The book analyses problems connected with the preparation of titanium-containing raw material for chlorination. The production of titanium tetrachloride, metallothermal methods of producing refining, and smelting titanium are examined. Methods of electrolytic production and refining titanium, the processing of titanium waste and titanium base alloys, and production of pigmentary titanium dioxide from titanium tetrachloride are described. Attention is paid to the properties of titanium and titanium-base alloys and the fields of their utilization. (Author)
- [Correlation of Electron-Transfer Rates with the Surface Density of States of Native and Anodically Grown Oxide Films on Titanium](#) Nov 16, 1990 22 pages
- Authors: [Norberto Casillas](#); [Shelly R. Snyder](#); [William H. Smyrl](#); [Henry S. White](#); [MINNESOTA UNIV MINNEAPOLIS DEPT OF CHEMICAL ENGINEERING AND MATERIALS SCIENCE](#)
- Full Text** We report tunneling spectroscopy (TS) and surface density of states (SDOS) plots ((dI/dV)/(IV) vs V) for native and anodically grown titanium dioxide (TiO₂) film on polycrystalline Ti. The results are compared to data obtained using single crystal TiO₂ ((001 and (110) surface orientations). SDOS plots for anodically grown TiO₂ films (160Å thick) and single crystal TiO show a large band-gap region (approx. 2eV) with a low state density separating the conduction and valence band edges. The similarity in ...
- [Monolayers of 11-Trichlorosilylundecyl Thioacetate: A System that Promotes Adhesion Between Silicon Dioxide and Evaporated Gold](#) May 1989 46 pages
- Authors: [Stephen R. Wasserman](#); [Hans Biebuyck](#); [George M. Whitesides](#); [HARVARD UNIV CAMBRIDGE MASS DEPT OF CHEMISTRY](#)
- Full Text** ... to improve the adhesion of gold to silicon substrates having a native silicon dioxide surface layer. Gold adheres to clean silicon, but not to silicon dioxide. The affinity of gold toward silicon dioxide can be improved by coating with chromium salts or titanium films or by adding interlayers containing fluoride salts. Bombardment of gold-covered silicon dioxide with electrons or heavy ions also enhances adhesion. Thin covalently-bonded ... of gold to glass. Here we demonstrate that covering a Silicon/Silicon dioxide substrate with a covalently attached organic monolayer film containing thiol groups (...
- [Investigation of Titanium Combustion Characteristics and Suppression Techniques](#) Feb 1976 68 pages
- Authors: [Duane G. Fox](#); [AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB OH](#)

Full Text This test program studies the burning characteristics of **titanium** under air flow conditions. The flat plate **titanium** samples are ignited by molten ... all tests with steady state burning. Argon gas is shown to be a feasible extinguishing agent for a **titanium** fire. Quick injection of a sufficient amount of argon gas to maintain a 60% concentration by volume of argon results in quick suppression by oxygen depletion. Carbon **dioxide** (CO₂), a common fire extinguishing agent, is shown to sustain **titanium** burning at an accelerated rate. The ultraviolet (UV) radiation emitted by burning **titanium** is shown ...

[Optimization of Binary Pigment Coatings](#)

Jan 5, 1987 61 pages

Authors: [Anthony T. Eng](#); [Charles R. Hegedus](#); [NAVAL AIR DEVELOPMENT CENTER WARMINSTER PA AIR VEHICLE AND CREW SYSTEMS TECHNOLOGY DIRECTORATE](#)

Full Text In this effort, an approach was devised and utilized to theoretically predict optimum coating compositions using two parameters, the maximum pigment packing factor and the coating critical pigment volume concentration, CPVC. Five binary pigment systems were evaluated in this study. 1. **Titanium dioxide** - silicon **dioxide**, 2. **titanium dioxide** - antimony oxide, 3. **titanium dioxide** - zinc chromate, 4. **titanium dioxide** - vesiculated polymer beads, 5. **titanium dioxide** - solid polymer beads. Each pigment systems was systematic

[A HREELS Investigation of Ethylene on Pt Model Catalysts](#)

May 20, 1990 19 pages

Authors: [D. A. Hensley](#); [L. L. Kesmodel](#); [INDIANA UNIV AT BLOOMINGTON DEPT OF PHYSICS](#)

Full Text ... an oxidized Al (aluminum) foil and a single crystal of TiO₂ (**titanium dioxide**). At 160 K the HREELS spectra show evidence of the di-sigma bonded ethylene species present on the supported ... Platinum) clusters, but upon warming to 325 K, only the TiO₂ (**titanium dioxide**) supported model catalyst shows evidence of forming the ethylidyne species commonly seen on Pt (Platinum ... spectra characteristic of ethylidyne has been seen. In the case of the TiO₂ (**titanium dioxide**) supported model catalyst, we believe this is the first HREELS observation of ethylidyne on supported metal clusters. ...

[Preparation of Fibers with Enhanced Ultraviolet \(UV\) Reflectance for Arctic Camouflage](#)

Dec 1991 22 pages

Authors: [Mark J. Hepfinger](#); [Lisa B. Hepfinger](#); [Peter J. Olejarz](#); [ARMY NATICK RESEARCH DEVELOPMENT AND ENGINEERING CENTER MA](#)

Full Text Samples of fiber containing different loadings of Zirconium Oxide and **Titanium Dioxide** were prepared using standard melt spinning techniques. These samples were then compared to the Arctic Camouflage fabric using ... UV reflectance. The fiber containing Zirconium Oxide shows a higher UV reflectance than either the Arctic Camouflage Fabric or samples containing **Titanium Dioxide**. **TITANIUM DIOXIDE**, **ULTRAVIOLET PHOTOGRAPHY**, **FIBERS**, **FABRICS**, **ARCTIC**, **ZIRCONIUM OXIDES**, **ARCTIC CLOTHING**, **NYLON**, **REFLECTANCE**, **ZIRCONIUM OXIDE**, **CAMOUFLAGE**, **NYLON 6**, ...

[Sputtered Thin Film Research.](#)

Oct 1973 59 pages

Authors: [Alexander J. Shuskus](#); [D. J. Quinn](#); [E. L. Paradis](#); [J. M. Berak](#); [D. E. Cullen](#); [UNITED AIRCRAFT RESEARCH LABS EAST HARTFORD CONN](#)

Full Text Progress on the process development as it relates to the optical quality of sputtered single crystal films of ZnO, AlN, and TiO₂ is discussed. Optical attenuation data for optical waveguide structures comprised of zinc oxide, aluminum nitride, **titanium dioxide** films grown on sapphire substrates and **titanium dioxide** on YZ cut lithium niobate is presented. The effect of deposition parameters on the carrier mobility of single crystal gallium arsenide films grown by reactive sputtering is presented. (Author)

[Development of a Primer/Topcoat and Flexible Primer for Aluminum](#)

Mar 20, 1987 36 pages

Authors: [Charles R. Hegedus](#); [NAVAL AIR DEVELOPMENT CENTER WARMINSTER PA AIR VEHICLE AND CREW SYSTEMS TECHNOLOGY DIRECTORATE](#)

Full Text ... improving aircraft paint systems. The first coating can be applied directly to an aluminum substrate and perform as a self-priming topcoat. It consists of a two component, aliphatic polyurethane binder with **titanium dioxide**, zinc molybdate, zinc phosphate, an organo-zinc salt, and **titanium dioxide** vesiculated bead pigments. This primer/topcoat meets or exceeds all of the critical performance requirements of the current Navy aircraft paint system. Mil-P-23377 epoxy primer and Mil-C-83286 polyurethane ...

[UNICOAT. Development Laboratory Characterization and Field Evaluation](#)

Mar 30, 1990 329 pages

Authors: [Charles R. Hegedus](#); [Anthony T. Eng](#); [Donald J. Hirst](#); [NAVAL AIR DEVELOPMENT CENTER WARMINSTER PA AIR VEHICLE AND CREW SYSTEMS TECHNOLOGY DEPT](#)

Full Text ... improving aircraft paint systems. The first coating can be applied directly to an aluminum substrate and perform as a self-priming topcoat. It consists of a two component, aliphatic polyurethane binder with **titanium dioxide**, zinc molybdate, zinc phosphate, an organo-zinc salt, and **titanium dioxide** vesiculated bead pigments. This primer/topcoat meets or exceeds all of the critical performance requirements of the current Navy aircraft paint system. Mil-P-23377 epoxy primer and Mil-C-83286 polyurethane ...

[Screening Smoke Performance of Commercially Available Powders. 3. Infrared and Visible Screening by Carbon Black](#)

Nov 1994 25 pages

Authors: [Janon F. Embury](#); [Donald L. Walker](#); [Curtis J. Zimmermann](#); [EDGEWOOD RESEARCH DEVELOPMENT AND ENGINEERING CENTER ABERDEEN PROVING GROUND MD](#)

Full Text ... microwave spectral regions. This report investigates carbon black pigments. Many of them attenuate visible radiation better than **titanium dioxide** described in the second report and a few of them attenuate infrared

radiation better than graphite flake described in the ... the screening properties. An additional criterion, contrast reduction, must be included when comparing a white visible screening smoke such as **titanium dioxide** with a black visible screening material such as carbon black. Results from modeling the contrast transmittance of white and black smokes ...

[Combination Primer/Topcoat Coating](#)

Dec 5, 1989 5 pages

Authors: [Charles R. Hegedus](#); [William J. Green](#); [DEPARTMENT OF THE NAVY WASHINGTON DC](#)

Full Text

A coating for metallic or polymeric composite substrates is disclosed which performs both as a primer and as a topcoat. It comprises a two component aliphatic polyurethane binder, with **titanium dioxide**, zinc molybdate, zinc phosphate an organo-zinc salt, and **titanium dioxide** vesiculated bead pigments in controlled amounts. The coating exhibits good adhesion, corrosion inhibition, flexibility, chemical and weather resistance, and opacity.

[Tunable, Highly Ordered TiO2 Nanotube Arrays on Indium Tin Oxide Coated PET for Flexible Bio-sensitized Solar Cells](#)

Aug 2011 19 pages

Authors: [Joshua J Martin](#); [ARMY RESEARCH LAB ABERDEEN PROVING GROUND MD](#)

Full Text

Highly ordered, free-standing **titanium dioxide** (TiO₂) nanotube (TNT) arrays have been of intense interest in the alternative energies field in recent years due to their barrier-free electron conduction pathway versus TiO₂ nanoparticles in dye sensitized solar cell (DSSC) designs. TNT arrays prepared by electrochemical anodization of **titanium** (Ti) foils and combined with a transparent, indium tin **dioxide** coated polyethylene terephthalate (PET) film are attractive candidates for efficient, flexible DSSCs. Flexible solar cells offer great benefits because of ...

[Combination Primer/Topcoat Coating.](#)

Dec 5, 1989 4 pages

Authors: [Charles R. Hegedus](#); [William J. Green](#); [DEPARTMENT OF THE NAVY WASHINGTON DC](#)

Full Text

A coating for metallic or polymeric composite substrates is disclosed which performs both as a primer and as a topcoat. It comprises a two component aliphatic polyurethane binder, with **titanium dioxide**, zinc molybdate, zinc phosphate, an organo-zinc salt, and **titanium dioxide** vesiculated bead pigments in controlled amounts. The coating exhibits good adhesion, corrosion inhibition, flexibility, chemical and weather resistance, and opacity. Patents. (aw)

[Biotic - Abiotic Interface Between they Body and the Artificial Limb](#)

Sep 29, 2008 29 pages

Authors: [Kenneth H Church](#); [SCIPERIO INC ORLANDO FL](#)

Full Text

... options. Our team has developed a modified **titanium** construct with a specially machined surface to increase the ... tensile strength similar to skin, and when it was printed on **titanium** constructs, the presence of the machined surface greatly increased the its adhesion to the **titanium**. The antibacterial properties of **titanium dioxide** anatase, silver nanoparticles, ... decrease in bacteria seen in non-treated HA. When the machined **titanium** constructs were implanted into a subcutaneous rat ... results show promise in developing a novel engineered **titanium** construct that promotes effective adhesion between ...

[Gateisolatoren fur MOS-Feldefektttransistoren \(Gate Isolators for MOSFETs\)](#)

Oct 2000 174 pages

Authors: [Thomas Pompi](#); [UNIVERSITAET DER BUNDESWEHR MUENCHEN NEUBIBERG \(GERMANY\) FAKULTAET FUER ELEKTROTECHNIK](#)

Full Text

... proceeds to the nitrogen barrier against boron diffusion. The bulk of the work concentrates on the tunneling of charged particles through a thin silicon **dioxide** layer as it functions in dual work function complementary MOS technology. Various gate leak flow mechanisms are used in examples with alternated MOSes. An analysis of the reliability with silicon **dioxide** layers with a thickness under five newtonmeters and **titanium dioxide** as an alternative gate nonconductor comprise, respectively, the last two chapters.

[Dynamic Fatigue of Ultralow-Expansion Glass for Space Mirrors. Reissue A](#)

Oct 30, 1988 31 pages

Authors: [Dana J. Speece](#); [AEROSPACE CORP EL SEGUNDO CA MATERIALS SCIENCES LAB](#)

Full Text

... , the flaw size distribution affects the expected lifetime at a given stress and failure probability. In addition, it is shown that the polished material is apparently less sensitive to subcritical crack growth than the unpolished glass. Keywords: Ceramics; Fatigue; Fracture; Mirrors; Ultralow expansion glass; Silicon **dioxide**; **Titanium dioxide**. (jhd)

[Impedance Analysis of Surface-Bound Biomembranes](#)

Jun 8, 1990 4 pages

Authors: [Jianguo Li](#); [Nancy W. Downer](#); [H. G. Smith](#); [TSI MASON RESEARCH INST WORCESTER MA BIOCHEMISTRY DEPT](#)

Full Text

Electrochemical impedance analysis was used to characterize biomembrane structures formed on Silicon/Silicon **Dioxide**, **Titanium Dioxide**, Indium/Tin Oxide and Platinum electrode surfaces by detergent dialysis. A model equivalent circuit is proposed to describe the membrane/electrode interface. The data suggest that the surface structure is a single membrane layer with resistance of 800 ohms per centimeters squared and capacitance of 550 nf/cm².

[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** ...) reflectance 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 ...
- Non-Chromate Metal Surface Etching Solutions** Jul 19, 14
2002 pages
- Authors: [Wayne C Tucker](#); [Maria G Medeiros](#); [Richard Brown](#); [DEPARTMENT OF THE NAVY WASHINGTON DC](#)
- Full Text** Non-chromate solutions for treating and/or etching metals, particularly, aluminum, aluminum alloys, steel and **titanium**, and method of applying same wherein the solutions include either a titanate or **titanium dioxide** as a drop-in replacement for a chromium-containing compound in a metal surface etching solution that otherwise would contain chromium.
- RESEARCH, LABORATORY TESTING AND THEORETICAL STUDIES SUPPORTING AFWL TREES PROGRAM** Jan 1965 250 pages
- Authors: [Harold Southward](#); [William J. Byatt](#); [W. W. Grannemann](#); [NEW MEXICO UNIV ALBUQUERQUE](#)
- Full Text** Hall effect semiconductor devices and **titanium dioxide** diodes have been found to be highly resistant to transient X-ray pulses. Transient X-ray radiation effects on air surrounding resistive elements as a function of pressure were measured and a theory developed for the effects. Continuous X-ray spectrums have been calculated from X-ray transmission data in the energy range from 180 kilovolts to 600 kilovolts and this method has proved to be satisfactory for outputs of both the flash X-ray and the DC X-ray machines in this energy range. In addition ...
- COMPOSITE SOLID PROPELLANT IGNITION: IGNITION OF AMMONIA AND OTHER FUELS BY PERCHLORIC ACID VAPOUR.** Jun 1966 22 pages
- Authors: [G. S. Pearson](#); [D. Sutton](#); [ROCKET PROPULSION ESTABLISHMENT WESTCOTT \(ENGLAND\)](#)
- Full Text** ... presence of a surface the order of decreasing ignitability was ammonia, isobutene, ethylene, methane. Cupric chromate and ferric oxide were effective catalysts in the ignition of gaseous fuels with perchloric acid vapour. **Titanium dioxide**, silica and alumina had no detectable effect. It is concluded that in ammonium perchlorate propellents the important reactions leading to ignition are heterogeneous rather than homogeneous, and that in a catalysed propellent the ...
- MECHANISMS OF DEGRADATION OF POLYMERIC THERMAL CONTROL COATINGS. PART II: EFFECTS OF RADIATION ON SELECTED PIGMENTS** Mar 1970 113 pages
- Authors: [Tomas E. Firlie](#); [Terry M. Flanagan](#); [GULF GENERAL ATOMIC CO SAN DIEGO CA](#)
- Full Text** ... investigation has been conducted on the mechanisms of degradation of pigments and polymeric coatings for thermal control applications exposed to ultraviolet (uv) and electron irradiation. The materials investigated were rutile (**titanium dioxide**) and strontium titanate (SrTiO₃). The effects of treating the pigments by heating in various gas ambients at elevated temperatures were studied using gas chromatography and electrical conductivity measurements. Significant changes in ...
- Development of Nonmetallic Fibrous Materials for Protection of Personnel from High Intensity Thermal Radiation.** Nov 1968 58 pages
- Authors: [Richard J. Shernit](#); [GOODRICH \(B F\) AEROSPACE AND DEFENSE PRODUCTS AKRON OHIO](#)
- Full Text** ... performed to select an inorganic oxide reflective coating which, when combined with a reinforcing fabric and insulative backing, can replace aluminized glass for thermal radiation shielding. Magnesium oxide, lanthanum oxide, and **titanium dioxide** were evaluated as reflectants. Glass and Nomex fibers and fabrics of various weaves were studied. Silicone rubber compounds were developed and modified to yield the proper degree of insulation. The early stages ...
- Characterization of Illuminated Semiconductor/Solid-Electrolyte Junctions. Semiconductor Redox Polymer Detector Junctions** Sep 15, 1985 25 pages
- Authors: [Sharon K. Schmidt](#); [Ronald L. Cook](#); [Anthony F. Sammells](#); [ELTRON RESEARCH INC AURORA IL](#)
- Full Text** ... was found to hold for all cells. The slope (M) was found dependent upon metal complex used and its oxidation state. The sensitivity of n-TiO₂, V sub fb to its immediate chemical environment at its interface with the redox polymer can be a strategy pursued for chemical detection. Keywords: Nafion 117; N-type **titanium dioxide**; Solid - state photoelectrochemical cells.
- Point Defect Structure of Cr2O3** Oct 1987 167 pages
- Authors: [M. Y. Su](#); [G. Simkovich](#); [PENNSYLVANIA STATE UNIV UNIVERSITY PARK APPLIED RESEARCH LAB](#)
- Full Text** ... know its transport properties and how these properties may be altered. In order to obtain a better understanding of the defect structure of Cr₂O₃, the electrical conductivity and Seebeck coefficient of sintered high purity Cr₂O₃, **Titanium Dioxide**, TiO₂-doped Cr₂O₃ and Magnesium Oxide MgO-doped Cr₂O₃ have been measured as functions of temperature, oxygen partial pressure and different levels of dopant content. Results from these measurements show that the defect ...
- Migration of Hazardous Substances through Soil. Part 4. Development of a Serial Batch Extraction Method and Application to the Accelerated Testing of Seven Industrial Wastes** Sep 1987 510 pages

Authors: [Duane E. Long](#); [Martin J. Houle](#); [Donald C. Weatherhead Jr.](#); [Gordon K. Ricks](#); [ARMY DUGWAY PROVING GROUND UT](#)

... more soil is penetrated), it was necessary to develop an experimental approach capable of simulating this dynamically-changing situation. Samples of wastes were collected from the following industries: zinc-carbon battery manufacturing, **titanium dioxide** pigment production, hydrofluoric acid manufacturing, white phosphorus production, oil re-refining, and two from zinc secondary-refining (cinders and scrubber-waste). Water extracts of these wastes were applied ...

[Full Text](#)

[Electrochemical and FTIR Spectroscopic Characterization of Ferrocyanide- Modified TiO Electrodes Designed for Efficient Photosensitization](#) Jul 15, 18
1988 pages

Authors: [J. Desilvestro](#); [S. Pons](#); [E. Vrachnou](#); [M. Gratzel](#); [UTAH UNIV SALT LAKE CITY DEPT OF CHEMISTRY](#)

... (CN)₆ indicate significant charge transfer from FeII to Ti VI. Ferrocyanide adsorption geometries are proposed on the basis of experimental data and geometric considerations of the anatase lattice. Light conversion efficiencies are discussed, and a model energy level diagram for the semiconductor/sensitizer/ electrolyte interface is presented. **Titanium dioxide**. (mjm)

[Full Text](#)

[Agent Degradation via Catalytic and Photocatalytic Reactions on Surfaces and in Organized Assemblies](#) Jun 9, 7 pages
1989

Authors: [Michael Graetzel](#); [ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE \(SWITZERLAND\)](#)

Research pursued under Contract no. DAJA45-87-C-005 has concentrated on the catalytic and photocatalytic destruction of simulants for V-agents in oxide semiconductor systems, in particular **titanium dioxide**. Near UV irradiation of TiO₂ semiconductor particles suspended in solution generates electrons and holes in the conduction and valence bands, respectively, free charge carriers that are highly reactive reductants and oxidants. We have previously shown that all the ...

[Full Text](#)

[Microstructure of Thin Films](#) Feb 7, 104
1990 pages

Authors: [H. A. Macleod](#); [ARIAS RESEARCH ASSOCIATES INC WHITTIER CA](#)

... size of the materials in thin film form. A completely different approach is given by growth modeling, but it remains to link the two techniques for a better understanding of the process of growth. Keywords: Metal films; Optical surface scattering; Optical constants for **titanium dioxide**; Tantalum oxide; Lanthanum fluoride; Optical coatings/surface measurements; Infrared optical materials; Trifluorides. France. (edc)

[Full Text](#)

[Self-Lubricating Surfaces by Ion Beam Processing](#) Jun 34
1990 pages

Authors: [Rabi S. Bhattacharya](#); [UNIVERSAL ENERGY SYSTEMS INC DAYTON OH](#)

... of (Calcium Fluoride/Silver) on (Silicon nitride) resulted in a very adherent coating that exhibited significantly low friction and wear characteristic at both room and elevated temperatures (800 deg C). Ion beam assisted **titanium dioxide** coating on M50 steel showed significantly improved friction and wear characteristics at room temperature. Ion beam assisted Cadmium Oxide coating lowered the friction coefficient of M50 steel 400C. The ion beam ...

[Full Text](#)

[Applications of Low-Coordination Phosphorus Chemistry in the Chemical Modification of Surfaces](#) Nov 13, 37
1992 pages

Authors: [Louis D. Quin](#); [MASSACHUSETTS UNIV AMHERST DEPT OF CHEMISTRY](#)

Low-coordination phosphorus compounds of various types (RO-PO₂, R- PO₂, RO-P(S)O, R-P=CH₂) were generated in the presence of suspended solids known to contain surface OH groups (silica gel, alumina, Zeolites, **titanium dioxide**). In all cases, the phosphorus atom became covalently attached to the O atom on the surface. CP-MAS 31P NMR was used extensively to prove the presence of the bonded group. Valuable HPLC characteristics were found for phosphorylated silica gel....

[Full Text](#)

[Evaluation of Oxidation Processes for Treating Aqueous Chemical Mixtures](#) Apr 95
1994 pages

Authors: [Theodore Mill](#); [C. C. Yao](#); [Her-King Song](#); [Stuart Smedley](#); [SRI INTERNATIONAL MENLO PARK CA](#)

The pathways of radical generation and consumption in several advanced oxidation processes (AOPs) involving ozone, peroxide, **titanium dioxide**, and UV light have been evaluated. HO is the principal oxidant in the AOPs at pH 7 and 2 as shown by measuring the relative reactivity ratio between butyrate and propionate ions. Several kinetic models have been developed to describe these oxidation processes in pure water and in a variety of natural waters. Both models and experiments show the importance of HCO₃ and humic ...

[Full Text](#)

[Nonlinear Optical Interactions and Materials](#) Feb 5 pages
1996

Authors: [Robert W. Boyd](#); [George L. Fisher](#); [ROCHESTER UNIV NY](#)

... by recent theoretical predictions that composite materials can possess a nonlinear susceptibility exceeding those of its constituent materials. We verified this prediction by constructing a composite material formed of alternating layers of **titanium dioxide** and the conjugated polymer poly paraphenylene benzobisthiazole, and demonstrating that the composite possessed a third-order susceptibility 35% larger than that of the polymers its more nonlinear constituent. A ...

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