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Jet Fuels



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[Thermal Oxidation Stability of Diesel Fuels](#) Feb 1986 222 pages

Authors: [L. L. Stavinoha](#); [J. G. Barbee](#); [D. M. Yost](#); [SOUTHWEST RESEARCH INST SAN ANTONIO TX BELVOIR FUELS AND LUBRICANTS RESEARCH FACILITY](#)

Full Text

Injector fouling bench tests(IFBT) and modified **Jet** Fuel Thermal Oxidation Test(JFTOT, ASTM D 3241) have been used to develop methodology for evaluating the thermal stability of diesel **fuels**. A new method for measuring the thickness of lacquer-type fuel deposits formed on test surfaces at elevated temperatures has been developed and applied to a variety of **fuels**, both with and without MIL-S-53021(additive stabilizer package). The utility of this technique greatly expands the capability for exploring and defining diesel ...

[Evaluation of Innovative Approaches to Stimulate Degradation of Jet Fuels in Subsoils and Groundwater](#) Jun 1992 35 pages

Authors: [Mick F. Arthur](#); [G. K. O'Brien](#); [Sarah S. Marsh](#); [Thomas C. Zwick](#); [BATTELLE COLUMBUS DIV OH](#)

Full Text

... Naval Air Test Center (NATC) under simulated conditions of soil venting. Surfactants and emulsifiers were screened for microbial toxicity and for their capacity to solubilize **jet** fuel from soil. Three surfactants were subsequently evaluated in 60-day flask aerobic biodegradation experiments. One surfactant was tested in soil columns under simulated soil venting Soil venting appears to overcome oxygen limitations in unsaturated soil and should be considered for enhanced biodegradation and soil bioremediation at NATC. Surfactants, emulsifiers, bioremediation, soil, water, **fuels**, soil venting.

[Petroleum Quality Information System Jet Fuels Data](#) Dec 30, 1998 49 pages

Authors: [DEFENSE ENERGY SUPPORT CENTER FORT BELVOIR VA](#)

Full Text

This is the second report, summarizing test results of aviation **fuels** received in calendar year 199? with comparison statistics from calendar year 1995 and 1996. Data is stored in our Petroleum Quality Information System (PQIS) Database which ... DCMD and DCMDI for their response in providing information for shipments that were missing from the database. The result of this effort was an increase by almost 1/2 billion gallons of **jet** fuel represented in the report. The JP4 representation increased to 100% for both 1996 and 1997. For 1996, JP5 representation increased from 24% in the 1990-1996 Report ...

[EFFECTS OF ANTI-ICING ADDITIVES ON JET FUEL PROPERTIES](#) May 1961 74 pages

Authors: [Daniel A. Netzel](#); [Thomas J. Byerley](#); [Harry B. Pollock](#); [MIDWEST RESEARCH INST KANSAS CITY MO](#)

Full Text

The storage stability of **jet fuels** containing anti-icing additive P55MB was investigated during a storage period of 5 months. Tests included (1) thermal stability, (2) gum content, (3) API gravity, (4) ... found in the natural water bottoms of fuel storage tanks. The physical stability of solutions of additive P55MB in **jet** fuel was studied as well as the water-retention characteristics of P55MB in **jet** fuel. The effects of anti-icing additives P55MB and Additive A on the hardness of the topcoating of the fuel tanks were studied in detail. A graphical relationship is ...

[DESIGN OF A FILTER-SEPARATOR TEST FACILITY FOR RESEARCH ON FUELS AND EQUIPMENT](#) Jun 1968 140 pages

Authors: [Robert K. Johnston](#); [Charles M. Monita](#); [Robert D. Brown](#); [Michael L. Valtierra](#); [SOUTHWEST RESEARCH INST SAN ANTONIO TX](#)

Full Text

A 15- to 60-gpm filter-separator test loop has been designed and built for research and development work on **jet fuels**, additive, and fuel handling equipment. Maximum flexibility has been provided in the loop and in the subsystems for blending and injecting additives, solid contaminants, and water. No materials that are harmful to the newer types of high-quality hydrocarbon **fuels** have been used in the fuel-wetted components of the loop, and the system consists primarily of aluminum and stainless steel. Initial operations with this ...

[Development of a Test Method for the Determination of the Hydroperoxide Potential and Antioxidant Effectiveness in Jet Fuels During Long Term Storage](#) Sep 1999 51 pages

Authors: [COORDINATING RESEARCH COUNCIL INC ATLANTA GA](#)

Full Text

... predicting the long term storage stabilities of military aviation turbine fuel reserves as well as for evaluating the effectiveness of antioxidants approved for these **fuels**. This report addresses this need. It describes a reliable and practical accelerated test method for predicting the peroxidation potential of aviation turbine **fuels** that are stored for long term periods. A test methodology is also proposed for evaluating antioxidants for future

qualification in the military specification, MIL-T-5624. ...

[Saturation Limits of Water in Jet Fuel](#)

Sep 1959

15 pages

Authors: [Dale A. Barsness](#); [Norman L. Bertram](#); [WRIGHT AIR DEVELOPMENT CENTER WRIGHT-PATTERSON AFB OH](#)

Full Text

A study of the saturation limits of water in current production of **jet fuels** over a temperature range of 40 degrees F to 90 degrees F was conducted in order to provide data on the effects of water solubility on uninhibited J-4 **jet** fuel and JP-4 containing corrosion inhibiting additives. This data is to serve as comparison with data ... the limits of the experimental error, it was observed that the addition of corrosion inhibiting additives to JP-4 **jet** fuel did not significantly increase the solubility of the water in the fuel.

[Investigation of "Apple Jelly" Contaminant in Military Jet Fuel](#)

Mar 2002

210 pages

Authors: [J. A. Waynick](#); [Steven R. Westbrook](#); [Larry Dipoma](#); [SOUTHWEST RESEARCH INST SAN ANTONIO TX DEPT OF ENGINES FUELS AND LUBRICANTS](#)

Full Text

Between 1980 and 1985, a representative of Imperial Oil made a presentation to Subcommittee J (aviation **fuels**) of ASTM Committee D2 concerning a contaminant found in the Alberta Products Pipeline (APPL). The contaminant had a high viscosity and was eventually called "APPL" ... jelly samples collected throughout the DoD/Air Force fuel-distribution system. The majority of our samples came from fuel systems delivering JP-8 to aircraft. All the **fuels** contained corrosion inhibitor, FSII (fuel system icing inhibitor), and SDA (static dissipator additive) in varying amounts. Other than FSII, this work ...

[Properties of JP-8 Jet Fuel](#)

May 1988

19 pages

Authors: [Charles R. Martel](#); [AIR FORCE WRIGHT AERONAUTICAL LABS WRIGHT-PATTERSON AFB OH](#)

Full Text

This report provides a summary of 80 JP-8 **jet fuels** produced over the time period of August 1984 to April 1988. The data were obtained from the test reports provided by the fuel supplier or receiving terminal. Averages, standards deviations, minimum and maximum values of the various data have been determined and are reported. Keywords: JP-8, **Jet** fuel, Chemical properties, Physical properties. (jes)

[Performance Evaluation of a Catalytic Partial Oxidation Hydrogen Generator Using Turbine Engine Fuels](#)

Oct 1977

43 pages

Authors: [Richard M. Clayton](#); [JET PROPULSION LAB PASADENA CA](#)

Full Text

... lean-burning qualities relative to the fuel gas exhibits superior lean-burning qualities relative to the fuel feed stock. The concept of using the very fuel-rich partial oxidation process as a first stage of a two-stage combustion system for onboard processing of broadened specification **fuels** to improve their combustion characteristics is discussed. For the nonoptimal reactor design used, excessive catalyst bed temperatures and a propensity for solid carbon deposition in the bed were observed. These phenomena are not fully understood and need further elucidation. Thermal reactor schemes (...

[Effect of Oxidizing Fuels on Aircraft Fuel System Elastomers and Sealants](#)

May 20, 1980

19 pages

Authors: [C. Nadler](#); [NAVAL AIR DEVELOPMENT CENTER WARMINSTERPA AIRCRAFT AND CREW SYSTEMS TECHNOLOGY DIRECTORATE](#)

Full Text

Jet fuels containing peroxides resulting from hydrogenation during refining have potential for damaging fuel system elastomeric components. Immersion tests were conducted for 1000 hours between 130 - 165 F in JP-5 containing 1, 5, and 10 meq. peroxide/1000 gm fuel with various fuel system sealants and elastomers. Damage thresholds were indicated and maximum allowable peroxide contents were recommended. (Author)

[Reference Filters for Electrostatic Charging Tendency Measurements of Fuels](#)

Sep 1987

36 pages

Authors: [Wilbur A. Affens](#); [GEO-CENTERS INC NEWTON CENTRE MA](#)

Full Text

A study has been made to determine whether laboratory filter papers might be suitable as reference filters for the determination of charging tendencies of **jet fuels** as measured in the EXXON Mini-Static Tester (MST). From the filter papers which were investigated it was concluded that, compared to commercial fuel filters, these filters do not generate enough charge to afford repeatable and reliable measurements. Some correlation was observed between the polarity of the generated charges and the nature of ...

[JP-8 Jet Fuel: Genotoxic and Cytotoxic Studies in Experimental Animals](#)

Jan 30, 2007

25 pages

Authors: [Vijayalaxmi](#); [Ivan L. Cameron](#); [TEXAS UNIV HEALTH SCIENCE CENTER AT SAN ANTONIO](#)

Full Text

Genotoxicity is often linked to carcinogenesis. The assessment of the genotoxic potential of any "agent" is important in terms of suggesting its carcinogenic potential. Hence, the evaluation of the genotoxic potential of **jet fuels**, JP-8 and Jet-A has been proposed in these investigations. The rodent micronucleus (MN) assay, which detects micronuclei, arising from both chromosomal fragments and unequal segregation of chromosomes during cell division has been ...

[Use of Measured Species Class Concentrations with Chemical Kinetic](#)

[Modeling for the Prediction of Autoxidation and Deposition of Jet Fuels](#)

Feb 2007

17 pages

(Postprint)

Authors: [Nicholas J. Kuprowicz](#); [Steven Zabarnick](#); [Zachary J. West](#); [Jamie S. Ervin](#); [AIR FORCE RESEARCH LAB WRIGHT-PATTERSON AFB OH TURBINE ENGINE DIV](#)

The production of detrimental carbonaceous deposits in **jet** aircraft fuel systems results from the involvement of trace heteroatomic species in the autoxidation chain that occurs upon fuel heating. Although it has been known

[Full Text](#) for many years that these sulfur-, nitrogen-, and oxygen-containing species contribute to the tendency of a fuel to form deposits, simple correlations have been unable to predict the oxidation rates or the deposit forming tendencies over a range of fuel samples. In the present work, a chemical kinetic mechanism developed previously is refined to include the roles of key ...

[Decontamination Performance of Selected in Situ Technologies for Jet](#)

1993

43 pages

[Fuel Contamination](#)

Authors: [Gary D. Chesley](#); [AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH](#)

[Full Text](#)

Specific study of **jet** fuel is warranted because of the quantitative and qualitative component differences between **jet** fuel and other hydrocarbon **fuels**. Quantitatively, **jet** fuel contains a larger aliphatic or saturate fraction and a smaller aromatic fraction than other **fuels** (i.e. heating oil and diesel oil) in the medium-boiling-point-distillate class of **fuels**. Since the aliphatic and aromatic fractions of fuel are not equally susceptible to biodegradation, **jet** fuel decontamination using biodegradation may be different from other **fuels**.

[Properties of F-34 \(JP-8\) Fuel for 1988](#)

Apr 1989

27 pages

Authors: [Charles R. Martel](#); [WRIGHT RESEARCH AND DEVELOPMENT CENTER WRIGHT-PATTERSON AFB OH](#)

[Full Text](#)

This report summarizes the properties of 95 F-34 **fuels** delivered to U.S. military installations during calendar year ... Korea and the United States. All of the F-34 **fuels** met Specification MIL-T-83133B requirements except for ... weight percent limit on mercaptan sulfur (commercial **jet** fuel specifications allow up to 0.003 ... percent) and the filtration-time limit. None of the **fuels** exceeded 0.001 weight percent mercaptan ... the filtration time limit, although several **fuels** were at the specification limit of 15 minutes. ... NATO F-34; Chemical properties; Physical properties; Average properties; **Jet fuels**. (KT) ...

[Burner Stabilities of Jet Diffusion Flames](#)

Dec 1990

151 pages

Authors: [James P. Seaba](#); [IOWA UNIV IOWA CITY DEPT OF MECHANICALENGINEERING](#)

[Full Text](#)

The near field lift-off phenomena associated with **jet** diffusion flames were investigated. Lift-off is defined as ... from the burner exit, stabilizing itself downstream. The lift-off of the **jet** diffusion flames were studied using a fuel **jet** centered in a large coflowing air annulus. **Fuels** used consisted of methane and propane. The **fuels** ... velocity. Lift-off velocity decreases as dilution concentrations of the fuel **jet** increase. The external geometry effects influence the lift-off ... flow rates. Two theories have explained the lift-off of **jet** diffusion flames. The locally premixed theory which assumes ...

[Fuel Microemulsions for Jet Engine Smoke Reduction](#)

May 1980

52 pages

Authors: [D. W. Naegeli](#); [G. E. Fodor](#); [C. A. Moses](#); [SOUTHWEST RESEARCH INST SAN ANTONIO TX MOBILE ENERGY DIV](#)

[Full Text](#)

... microemulsions for the purpose of reducing smoke emissions from **jet** engine test cells was studied in a T-63 ... prepared with JP-4 and JP-8 base **fuels** and the appropriate surfactants. Both metallic ... possible synergistic effects when combined with the microemulsified **fuels**. The **fuels** were tested at the takeoff, climb, ... additions of alcohols and water to the base **fuels**. Ethanol was found to be most cost effective ... ratio in the same way as typical petroleum-base **fuels**. Ferrocene, which is well known for its ... had the same effect on the microemulsions as the base **fuels**; it did not affect flame radiation ...

[Conductivity and Charging Tendency of JP-8 + 100 Jet Fuel](#)

Sep 18, 2000

52 pages

Authors: [J. T. Leonard](#); [D. R. Hardy](#); [NAVAL RESEARCH LAB WASHINGTON DC MATERIAL SCIENCE AND TECHNOLOGY DIV](#)

[Full Text](#)

... and the Octel Static Dissipater Additive, Stadis 450, on the electrical conductivity and electrostatic charging tendency of **Jet A fuels** were examined using a variety of filter media. It ... at a concentration of 256 mg/l, increased the conductivity of most **fuels** to above 100 pS/m and of 15% of the **fuels** ... above 150 pS/m, which is the lower specification limit for JP-8 **fuels**. The Betz additive increased the charging tendency to very high levels ... both the non-conductive and conductive reticulated foams was quite low. **Fuels** containing Stadis 450 exhibited high charging on most ...

[In Situ Remediation of Low-Volatility Fuels Using Bioventing Technology](#)

Sep 1993

41 pages

Authors: [Jeffrey A. Kittel](#); [Ronald E. Hoeppe](#); [Robert E. Hinchee](#); [Thomas C. Zwick](#); [Richard J. Watts](#); [NAVAL CIVIL ENGINEERING LAB PORT HUENEME CA](#)

[Full Text](#)

Data were collected at four U.S. Navy and Marine Corps bases to evaluate bioventing technology efficacy in removing low-volatility **fuels** from subsurface soils and the groundwater table. These sites have soil contamination attributed to spills or leaks of **fuels** having low vapor pressures and very low water solubilities, such as JP-5 **jet** fuel, diesel fuel, #6 fuel oil (bunker fuel), waste oil, and lubricants. The major contaminant studied is JP-5 **jet** fuel, a kerosene distillate fraction similar to commercial **jet** fuel A.

[Trace Element and Polycyclic Aromatic Hydrocarbon Analyses of Jet Engine Fuels: Jet A, JP5, and JP8](#)

Dec 2000

33 pages

Authors: [L. A. Shumway](#); [SPACE AND NAVAL WARFARE SYSTEMS CENTER SAN DIEGO CA](#)

[Full Text](#)

This Technical Report analyzes four fuel samples: one sample of commercial **Jet A (Jet Aviation)** fuel, one sample of JP8 fuel, and two samples of JP5 fuel. The samples were analyzed for elements and Polycyclic Aromatic Hydrocarbons (PAHs). A larger database would enable definition of a range of typical element and PAH values in **jet** fuel. It would also help determine which elements in the **fuels** are present as delivered from the refinery or are introduced as storage and delivery system contaminants.

[Fuels Combustion Research](#)

Oct 31, 1987

37 pages

Authors: [Frederick L. Dryer](#); [Irvin Glassman](#); [Forman A. Williams](#); [PRINCETON UNIV NJ DEPT OF MECHANICAL AND AEROSPACE ENGINEERING](#)

... height experiment and the extent of aromatic formation measured in both inverse and normal diffusion flames. Work on the oxidation of the aromatics present in **jet** propulsion **fuels** continues with th major effort directed at the dialkylated benzenes. The major study concerned the oxidation of para-xylene. The results indicate oxidation of one ... hypothesis of the formation of the impermeable shell and subsequent disruption phenomena. Keywords: Born slurry combustion; Boron cloud combustion; Slurry **fuels**; **Jet** engine **fuels**.

Full Text

[Fuel Lubricity Additive Evaluation](#)

Jun 1997

63 pages

Authors: [P. I. Lacey](#); [S. R. Westbrook](#); [SOUTHWEST RESEARCH INST SAN ANTONIO TX TARDEC](#) [FUELS AND LUBRICANTS RESEARCH FACILITY](#)

... diesel, which has been used for many years. **Jet** A-1 and JP-8 have a number of advantages compared to ... aviation and ground vehicles on the battlefield. However, kerosene based **fuels** typically have reduced lubricity compared to diesel **fuels**, potentially reducing injection system durability and vehicle readiness. A range of lubricity ... the effectiveness of these additives when used in kerosene based **fuels**. A number of additives were obtained and evaluated using ... with two additive concentrations in a very severely refined **Jet** A-1 fuel. The results indicate that the commercially available lubricity ...

Full Text

[Comparative Neurobehavioral Toxicity Assessment of Three Hydrocarbon Fuels](#)

Aug 1998

83 pages

Authors: [Alan F. Nordholm](#); [NAVAL MEDICAL RESEARCH INST TOXICOLOGY DETACHMENT WRIGHT- PATTERSON AFB OH](#)

There is increasing evidence that repeated human occupational exposure to low concentrations of **fuels** can result in significant changes in neurobehavioral capacity. Recent evidence indicates that repeated exposure of rodents to **jet** fuel vapor/aerosol can induce significant changes in physiological function. To ... , 5 days/week, for 6 consecutive weeks, to JP-8 (1 mg/L) **jet** fuel, JP-5 **jet** fuel, or diesel fuel vapor in whole body inhalation chambers. ... are compared to data reported previously for fuel industry workers exposed to **jet** fuel vapors for up to 32 years.

Full Text

[Quantitating the Percutaneous Absorption of Mechanistically Defined Chemical Mixtures](#)

Feb 2, 2001

109 pages

Authors: [Jim E. Riviere](#); [Ronald E. Baynes](#); [Charles Smith](#); [NORTH CAROLINA STATE UNIV AT RALEIGH CUTANEOUS PHARMACOLOGY AND TOXICOLOGY CENTER](#)

The focus of this research was to assess the percutaneous absorption and cutaneous toxicity of **jet fuels** (**Jet** A, JP-8, JP-8 +100). The absorption of **jet** fuel hydrocarbons (naphthalene, dodecane, hexadecane) was studied as a function of **jet** fuel type and the presence of individual or all possible combinations of performance additives (DIEGME, 8Q2I, ... in IPPSFs as well as in human and porcine keratinocyte cell cultures as well as in vivo pigs. All **fuels** produced evidence of skin toxicity and resulted in production and release of the cytokines IL-8 and ...

Full Text

[Properties of Aircraft Fuels and Related Materials](#)

Aug 1985

163 pages

Authors: [D. S. Duvall](#); [A. D. Snyder](#); [J. Henry](#); [D. J. Lewis](#); [F. N. Hodgson](#); [MONSANTO CO DAYTON OH DAYTON LAB](#)

... analytical method development were conducted on a number of **fuels** of an experimental nature in conjunction with ongoing Air Force ... design, and other fuel related technologies. **Fuels** from conventional and alternate sources were studied, ... of both physical and chemical properties of the **fuels** were measured and are tabulated. Studies conducted ... the solution of operational problems are also reported. Keywords: **Jet** engine **fuels**; High density **fuels**; Fuel contaminants; JP-4 fuel; Shale oils; Fuel additives; ... Fuel vapors; Hydrocarbon type analyses; Modified **fuels**; Fuel composition; Fuel charging tendency; ...

Full Text

[A Survey of JP-8 and JP-5 Properties](#)

Sep 1988

111 pages

Authors: [J. N. Bowden](#); [S. R. Westbrook](#); [M. E. Lepera](#); [SOUTHWEST RESEARCH INST SAN ANTONIO TX BELVOIR](#) [FUELS AND LUBRICANTS RESEARCH FACILITY](#)

With the help of the Defense Fuel Supply Center, JP-8, **Jet** A-1, and JP-5 samples from worldwide sources, representing tenders of products destined for Department of Defense bases, have been received at Belvoir **Fuels** and Lubricants Research Facility at Southwest Research Institute for evaluation. Inspection ... data provided by the supplier, and tests related to the use of these **fuels** in diesel engines, which were measured cetane number, calculated cetane indices ... heat of combustion, and kinematic viscosity measurements at 40 and 70 C. **Jet** fuel, Aircraft turbine fuel, J-5, JP-8, Diesel fuel. (...)

Full Text

[Fuels Combustion Research: Supercritical Fuel Pyrolysis](#)

Sep 21, 2000

39 pages

Authors: [Irvin Glassman](#); [PRINCETON UNIV NJ DEPT OF MECHANICAL AND AEROSPACE ENGINEERING](#)

Present and anticipated variation in **jet** propulsion **fuels** due to advanced engine compression ratios and airframe cooling requirements necessitate ... to understanding the pyrolysis and combustion of endothermic **fuels** under subcritical conditions and the pyrolysis of these ... and tetralin, which are not only endothermic **fuels**, but alkylcyclohydrocarbons, the naphthene components of JP **fuels**. The subcritical conditions in the study were 0.1 MPa (1 atm) and temperatures ranging between 900-1200 ... were complete scission products of all these **fuels** found for both cases, but, interestingly, ...

Full Text

[Evaluation of Thermal Stability Improving Additives for Jet Fuel in Both Laminar and Turbulent Flow Test Units](#)

Sep 2000

24 pages

Authors: [John E. Colbert](#); [Clarence J. Nowack](#); [NAVAL AIR WARFARE CENTER AIRCRAFT DIV PATUXENT RIVER MD](#)

... evaluated the individual benefits of 3 different thermal stability improving additives (TSIAs) in **jet** fuel using 2

separate, small-scale test devices - one laminar flow and the ... deposits (measured via carbon burnoff) in both flow regimes for 3 different base **fuels** tested. Both units rank the level of thermal stability in the same order for the 3 baseline **fuels** tested. In addition, both devices show that Betz 8Q462. is the most ... laminar unit. However, one exception had occurred when MDA was added to one of the test **fuels** (Tank 20122), which caused an increase in deposition compared to the neat ...

[Full Text](#)

[Fuels Combustion Research: Supercritical Fuel Pyrolysis](#)

Jan 22, 2001

41 pages

Authors: [Irvin Glassman](#); [PRINCETON UNIV NJ DEPT OF MECHANICAL AND AEROSPACE ENGINEERING](#)

Present and anticipated variation in **jet** propulsion **fuels** due to advanced engine compression ratios and airframe cooling requirements necessitate greater ... to understanding the pyrolysis and combustion of endothermic **fuels** under subcritical conditions and the pyrolysis of these ... and tetralin, which are not only endothermic **fuels**, but alkylcyclohydrocarbons, the naphthene component of JP **fuels**. The subcritical conditions in the study were 0.1 MPa (1 atm) and temperatures ranging between 900-1200 K. ... were complete scission products of all these **fuels** found for both cases, but, interestingly, ...

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[A Low Power, Novel Ignition of Fuels Using Single-Wall Carbon Nanotubes \(SWCNTs\) and a Camera Flash \(PREPRINT\)](#)

Nov 14, 2005

9 pages

Authors: [S. A. Danczyk](#); [B. Chehroudi](#); [A. D. Ketsdever](#); [G. L. Vaghjani](#); [ENGINEERING RESEARCH AND CONSULTING INC \(ERC INC\) EDWARDS AFB CA](#)

... consisting of heavy components, and by its nature is a single-point stimulus method. Other ignition methods, such as plasma **jet** injection or flame **jet** initiation and high-power laser ignition, are all bulky, heavy, and expensive to operate. This paper ... a low-power novel ignition method that uses a single exposure of an ordinary camera flash and SWCNTs to ignite various **fuels**. We have shown that this method is able to ignite both solid and liquid **fuels**. The effects of the iron (Fe) nanoparticles (embedded in the SWCNTs) concentration on the ignition process have been studied. One application of ...

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[A Low Power, Novel Ignition of Fuels Using Single-Wall Carbon Nanotubes \(SWCNTs\) and a Camera Flash \(POSTPRINT\)](#)

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... consisting of heavy components, and by its nature is a single-point stimulus method. Other ignition methods, such as plasma **jet** injection or flame **jet** initiation and high-power laser ignition, are all bulky, heavy, and expensive to operate. This paper ... a low-power novel ignition method that uses a single exposure of an ordinary camera flash and SWCNTs to ignite various **fuels**. We have shown that this method is able to ignite both solid and liquid **fuels**. The effects of the iron (Fe) nanoparticles (embedded in the SWCNTs) concentration on the ignition process have been studied. One application of ...

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[Lifted Turbulent Jet Flames](#)

Apr 14, 1993

156 pages

Authors: [Jay A. Hammer](#); [CALIFORNIA INST OF TECH PASADENA GRADUATE AERONAUTICAL LABS](#)

Experiments were conducted on lifted, turbulent **jet** diffusion flames. A linear photodiode array was used to measure the temporal history ... mean liftoff height bar-h under a wide range of flow conditions, including several **fuels**, nozzle diameters, and exit velocities U (sub s), showed an approximately ... of the fluctuations in bar-h were found to be of the order of the local large scale of the **jet** but the time scales were found to be much larger than the local large-scale time of the turbulence tau delta. By using **fuels** of different chemical times to vary tau delta, the measured correlation time tau ...

[Full Text](#)

[Emissions Reduction by Catalytic Reformulation of Jet Fuel](#)

May 21, 2002

34 pages

Authors: [James Markham](#); [Patrick Bush](#); [Michael Best](#); [Alvin Berlin](#); [William Lueckel](#); [ADVANCED FUEL RESEARCH INC EAST HARTFORD CT](#)

... will be reduced. This project undertook demonstration of an innovative catalyst with potential to reformulate **jet** fuel to result in reduced emissions from gas turbine engines. Phase I work completed ... combustor, and a 3,300 lb thrust gas turbine engine. For both, **jet** fuel went through an exposure period to catalyst in the fuel storage ... tested. Emissions measurements were performed for sequential firing with untreated and treated **fuels**. Gas phase data from the atmospheric combustor (Jet-A and JP-8 **fuels**) and the turbine engine (Jet-A fuel) showed no measurable benefit in emissions reduction by ...

[Full Text](#)

[Shock Tube Measurements of Ignition Processes and Spray-Shock Wave Interactions](#)

Apr 6, 2008

26 pages

Authors: [Ronald K. Hanson](#); [David F. Davidson](#); [STANFORD UNIV CA DEPT OF MECHANICAL ENGINEERING](#)

We report results of high-temperature shock tube research aimed at improving knowledge of the combustion behavior of diesel, **jet** and related **fuels**. Research was conducted in four Stanford shock tube facilities and focused on the following topics: (1) development of the aerosol shock tube; (2) ignition delay time measurements of gaseous **jet fuels** (JP-8 and Jet-A) and surrogate components at high pressures ... time-histories for OH radicals and alkanes; (4) ignition delay times of n-dodecane, **jet** fuel and diesel using the aerosol shock tube technique; and (5) ...

[Full Text](#)

[Simulations of the Freezing of Jet Fuel](#)

Mar 2003

13 pages

Authors: [J. S. Ervin](#); [D. Atkins](#); [C. Obringer](#); [AIR FORCE RESEARCH LAB WRIGHT-PATTERSON AFB OH](#)

The objective of this research is to obtain images of the freezing of hydrocarbon **fuels** within a simple flow to assist understanding of the interaction between the ... is to describe a computational model of the freezing process. JPTS, **Jet A**, and additized **Jet A** samples were cooled in a rectangular, aluminum ... flow. Cooling of JPTS resulted in the lowest volume of solids. When cooled, **Jet A** fuel containing a low-temperature additive

[Full Text](#)

exhibited a smaller solid volume than did the neat fuel. In addition, the additized **Jet A** fuel developed a population of suspended particles that was greater than that ...

[GAS TURBINE AND JET ENGINE FUELS](#)

Apr 6, 1961

16 pages

Authors: [W. L. Streets](#); [PHILLIPS PETROLEUM CO BARTLESVILLE OK](#)

Full Text

INITIATION OF THIS STUDY HAS BEEN BROUGHT ABOUT AS A RESULT OF REPORTS OF MARKEDLY DECREASED LIFE OF **JET** ENGINE HOT SECTION COMPONENTS IN ENGINES OPERATING ON S-containing **fuels** in sea water laden atmospheres. Results of testing carried on to date in this laboratory have indicated the following: Synthetic sea water (ASTM D655) showed no significant tendency to increase or decrease flame to be metal loss above or below the values observed for operation on 1% S fuel without sea water injection, even at ...

[Thermodynamics of Organic Compounds](#)

Nov 1982

21 pages

Authors: [B. E. Gammon](#); [N. K. Smith](#); [DEPARTMENT OF ENERGY BARTLESVILLE OK BARTLESVILLE ENERGY TECHNOLOGY CENTER](#)

Full Text

... per unit volume or per unit mass and thus be useful in the synthesis of high energy **fuels**. These materials were synthesized, and their thermodynamic properties were evaluated. In cooperation with researcher at Wright-Patterson Air Force Base, ramjet **fuels** currently in use were subjected to careful thermodynamic evaluation by measurements of heat capacity, enthalpy of combustion and vapor pressure. During the last year of this effort, seven kerosene-type **fuels** produced by British Petroleum and seven **jet fuels** produced from shale oil were studied. (Author)

[Antimisting Fuel Research and Development for Commercial Aircraft](#)

Apr 1986

100 pages

Authors: [Michael L. Yaffee](#); [FEDERAL AVIATION ADMINISTRATION TECHNICAL CENTER ATLANTIC CITY NJ](#)

Full Text

... development, testing, and evaluation conducted by the Federal Aviation Administration in pursuit of an effective, feasible antimisting agent for kerosene **jet fuels** that would prevent or reduce the dangers of postcrash, fuel mist fires. For the past eight years, most of this ... antimisting fuel concept. The results of this work indicate that the goal is achievable: **Jet** fuel can be modified to provide a significant degree of protection against ... appear to be no technically insurmountable problems. Keywords: Antimisting kerosene; Safety **fuels**; Aircraft safety. (Author)

[Air Force Site Characterization and Analysis Penetrometer System](#)

[\(AFSCAPS\): Laser-Induced Fluorescence Cone Penetrometer - Testing at](#)

Dec 1994

103 pages

[Carswell AFB TX. Volume 3](#)

Authors: [James D. Shinn](#); [Wesley L. Bratton](#); [APPLIED RESEARCH ASSOCIATES INC SOUTH ROYALTON VT NEW ENGLAND DIV](#)

Full Text

... River. The LIF identified gasoline contamination in the soils near the BSS underground storage tanks. The soil across the road was not identified as contaminated; however the LIF-CPT was only calibrated for **jet fuels** under the contract and detection limits for gasoline are currently unknown. Results for **jet fuels** indicate that LIF-CPT has a detection limit of 100 ppm for Total Petroleum Hydrocarbons (TPH). Preliminary field testing did confirm that the LIF-CPT does respond to gasoline and can indicate ...

[Application of Pattern Recognition Techniques to Problems in Advanced](#)

[Pollution Monitoring](#)

May 1995

238 pages

Authors: [B. K. Lavine](#); [A. B. Stine](#); [X. H. Qin](#); [CLARKSON UNIV POTSDAM NY DEPT OF ELECTRICAL AND COMPUTER ENGINEERING](#)

Full Text

... for classifying environmental analysis patterns of mixed samples, such as samples of mixed **fuels**. The technique was developed and applied to data patterns representing classification measurements on ... data set. It was tested further with data patterns representing gas chromatograms of pure and mixed samples of **jet fuels**. The FCV classification algorithm was implemented as a computer program, written in the FORTRAN computer programming language, and using data display ... the FCV system from the Fisher iris data set and from the **jet** fuel data sets. The technical report also provides a user's guide ...

[Sensory Irritation Study in Mice: JP-4, JP-8, JP-8+100](#)

Aug 29, 2001

68 pages

Authors: [Frederick T. Whitman](#); [John P. Hinz](#); [EXXON RESEARCH AND ENGINEERING CO ANNANDALE NJ](#)

Full Text

AFIERA, in concert with Army and Navy colleagues, designed a study based on ASTM's 'Standard Method E 981-84' to characterize and compare the relative potency of three **jet fuels** to cause respiratory tract sensory irritation. These **fuels** were JP-4, JP-8 and JP-8 + 100. These **fuels** were administered for 30 minute periods by means of a head-only exposure system to groups of four male Swiss-Webster mice. Test atmospheres laden with these **fuels** were presented as vapor-only (JP-4) or as a vapor/aerosol mixtures (JP-8, JP-8 + 100).

[US Navy Evaluation of the High Reynolds' Number Thermal Stability](#)

[\(HiReTS\) Test Unit](#)

Apr 23, 2003

78 pages

Authors: [John E. Colbert](#); [Clarence J. Nowack](#); [Richard A. Kamin](#); [Douglas F. Mearns](#); [NAVAL AIR SYSTEMS COMMAND PATUXENT RIVER MD FUELS AND LUBRICANTS DIV](#)

Full Text

The HiReTS was developed by Shell Global Solutions, **Fuels** Business Group as a small-scale unit for evaluating the thermal stability of **jet** fuel prior to shipment to the consumer. The HiReTS was designed to operate at high fuel flow rates through a heated, stainless steel tube (capillary) representative of ... regime. The presence of high turbulence in the HiReTS also eliminates the sensitivity of mass transport effects that occur in laminar flow test devices such as the **Jet** Fuel Thermal Oxidation Tester (JFTOT), which operates at a Re of approximately 10.

[Examination of JP-8 Fuels for Contaminants Responsible for KC-130J](#)

May 16, 2006

16 pages

[Nozzle Fouling](#)Authors: [Robert E. Morris](#); [Kevin J. Johnson](#); [Christina DiGiulio](#); [NAVY TECHNOLOGY CENTER FOR SAFETY AND SURVIVABILITY WASHINGTON DC](#)**Full Text**

... The overall chemical compositions of the 26 JP-8 samples were found by chemometric modeling to be within the range of compositions determined in the 240 worldwide JP-8, JP-5, and **Jet A fuels** currently in our reference **fuels** database. This result was obtained from analyses by both gas chromatography and NIR spectroscopy. The analysis did reveal normal batch to batch variations between the **fuels** sampled from the storage facility at Aqaba and those sampled further down the supply chain at the Al Asad airbase. ...

[A Hydrocarbon Fuel Flash Vaporization System for a Pulsed Detonation](#)

Dec 2006

29 pages

[Engine](#)Authors: [K. C. Tucker](#); [Paul I. King](#); [Frederick R. Schauer](#); [AIR FORCE RESEARCH LAB EGLIN AFB FL MUNITIONS DIRECTORATE](#)**Full Text**

Practical operation of pulsed detonation propulsion requires operation on kerosene-based **jet fuels**. These low vapor pressure **fuels** remain in liquid form at typical pulsed detonation inlet conditions and residence times, and ... built to reduce evaporation time and provide gaseous fuel to the PDE. Four **fuels** that vary in volatility and octane number were tested: n-heptane, iso-octane, aviation ... and JP-8. Results showed the FVS quickly provides a detonable mixture for all of the **fuels** tested without cooking the fuel lines. A significant result was the ...

[High-Pressure Liquid Chromatograph with Mass Spectrometric Detection for Analysis of Supercritical Fuels Pyrolysis Products](#)

Aug 1, 2006

52 pages

Authors: [Mary J. Wornat](#); [Michelle L. Somers](#); [Jennifer W. McClaine](#); [Jorge O. Ona](#); [LOUISIANA STATE UNIV BATON ROUGE DEPT OF CHEMICAL ENGINEERING](#)**Full Text**

... aromatic hydrocarbons (PAH) produced in supercritical pyrolysis experiments with the model **fuels** 1-methylnaphthalene and toluene. The HPLC/UV/MS instrument facilitated the ... of which had ever before been identified as products of these **fuels**. Most of the newly identified products were large PAH thought to ... elucidation of radical reaction pathways responsible for PAH formation from aromatic **fuels** in the supercritical pyrolysis environment. Use of the HPLC/UV/MS instrument in the analysis of a stressed Fischer-Tropsch synthetic **jet** fuel sample from United Technologies Research Center led to the ...

[Potential for Peroxide and Gum Formation in Ultra-Low-Sulfur Diesel](#)

Oct 31, 2007

24 pages

[Fuels](#)Authors: [Heather D. Willauer](#); [Dennis R. Hardy](#); [Robert E. Morris](#); [Frederick W. Williams](#); [NAVAL RESEARCH LAB WASHINGTON DC](#)**Full Text**

... was conducted to determine the level of risk associated with using Ultra Low Sulfur Diesel (ULSD) **Fuels** in Naval operations. The findings show the level of risk for hydroperoxide and soluble gum formation in these **fuels** is not well understood. Thus, specific test methods have been identified for determining if these **fuels** will meet the Navy's long-term storage requirements. In addition, approved antioxidants formulations for **jet** fuel (MIL-DTL-5624R) have been recommended as a potential solution in mitigating peroxide and gum formation in ...

[Combustion of JP8 in Laminar Premixed Flames](#)

Mar 12, 2008

19 pages

Authors: [Kalyanasundaram Seshadri](#); [CALIFORNIA UNIV SAN DIEGO LA JOLLA](#)**Full Text**

... that can reproduce selected aspects of combustion of JP-8. Surrogate **fuels** are defined as mixtures of few hydrocarbon compounds with combustion characteristics similar to those of commercial **fuels**. A mixture of n-decane and trimethylbenzene, called the Aachen ... conditions are carried out employing the counterflow configuration. The **fuels** tested are JP-8 and the Aachen surrogate. Critical conditions ... volume fraction agree well with experimental data. Experimental studies are carried out to characterize premixed combustion of **jet fuels** and its surrogates in laminar nonuniform flows. ...

[Heat Transfer, Fouling, and Combustion of Supercritical Fuels](#)

Apr 28, 1994

67 pages

Authors: [L. D. Chen](#); [IOWA UNIV IOWA CITY DEPT OF MECHANICAL ENGINEERING](#)**Full Text**

... to investigate the dynamics of the vortex and flame interaction in **jet** diffusion flames and the transport phenomena associated with the ... fluids into a sub-critical environment. The vortex-flame interaction in a near-laminar **jet** diffusion flame was quantified by a planar visualization and the vortex ... line visualization. The measured vortex crossing frequency in transitional **jet** diffusion flames was used to verify the time-dependent diffusion flame calculations. ... investigation on the mixing in the super-critical sprays was suggested. Combustion, **Jet** diffusion flames, Sprays, Supercritical sprays.

[Immunosuppressive Effects of Jetfuel and Its Mechanism of Action](#)

May 2002

79 pages

Authors: [Ramos Gerardo](#); [TEXAS UNIV HEALTH SCIENCE CENTER AT HOUSTON](#)**Full Text**

Applying military **jet** fuel (JP-8) to the skin of mice activates systemic immune suppression. In all ... , JP-8 was applied to immunologically naive mice. The effect of **jet fuels** on established immune reactions, such as immunological memory, is unknown. The focus of the experiments presented here was to test the hypothesis that **jet** fuel exposure (both JP-8 and commercial **jet** fuel; Jet-A) suppresses established immune reactions. Mice were immunized with the opportunistic ... selective cyclooxygenase-2 (COX-2) inhibitor (SC 236) significantly reversed **jet** fuel-induced suppression of immunologic memory.

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