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JP8+100 Jet Fuel Toxicity: Proteomic Analysis Apr 30, 2003 22 pages

Authors: Frank A. Witzmann; INDIANA UNIV AT BLOOMINGTON SCHOOL OF MEDICINE

Full Text

This final technical report describes the results of experiments that were undertaken to analyze the effect of JP8 jet fuel exposure by aerosol/vapor on quantitative and qualitative gene expression in rodent tissues. The stated objectives were to 1) generate gene expression databases for some of the major rodent target tissues, 2) identify as many of the affected gene products as possible, and 3) apply the observed molecular alterations to elucidating JP8's multifaceted toxicity. As a result of our efforts we have determined that both acute and chronic JP8 exposure significantly alters ...

JP8 Induced Mutagenesis and Hormesis Mar 13, 2008 11 pages

Authors: Purushottam Kale; ALABAMA A AND M UNIV NORMAL

Full Text

In order to test the phenomenon of JP8 induced hormesis and mutagenesis in Drosophila, several experiments were performed using samples over 5000 individuals in each experiment. The JP8 doses were progressively decreased from 5 microliters to 0.5 microliters in 1000 milliliters of air. Exposures were for 12 hours and survival was counted after 10 days. At a dose of 5 microliters, the survival was 80% which increased (or lethality decreased) at lower doses. Below this dose, there was no significant decrease in the survival. Still lower doses need to be tested to investigate if there is a ...

Effects of JP8 on Neural Structure and Function Feb 1, 2001 9 pages

Authors: Frank L. Siegel; Steven E. Kornguth; WISCONSIN UNIV-MADISON

Full Text

We have completed all analyses. The results indicate the great importance of including sham controls in all JP8 studies. The most significant effect was the increase of hippocampal DOPAC during the exposure period, indicative of increased dopamine release and turnover. We conclude that with this significant exception, JP8 exposure at this level caused no global alterations in neurotransmitter levels.

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.

JP8 Reformation for Combat Vehicles Aug 7, 2007 5 pages

Authors: TACOM RESEARCH DEVELOPMENT AND ENGINEERING CENTER WARREN MI

Full Text

Objectives: Reduce sulfur content in raw JP8 fuel to less than 1 ppmw; Demonstrate successful system integration by reforming desulfurized product to generate hydrogen at 10 kWe rate. Key technology development: 1. Hydrodesulfurization (HDS) system- reduce sulfur content to < 10 ppmw. 2. Sulfur Polishing- reduce sulfur content to < 1 ppmw. 3. Fuel Reformer- sustained, stable operation using HDS product.

Biomarkers Toxicant Exposure May 1, 1999 10 pages

Authors: Frank Siegel; Steven Kornguth; WISCONSIN UNIV-MADISON

Full Text

The goal of this study was to develop biomarkers of toxicant exposure, in rodent models, with a focus on lead a and the military jet fuel JP8. Our results demonstrated that these toxicants caused significant alterations in the levels of specific detoxication enzymes. These affected enzymes are members of the family of glutathione S-transferases (GSTs) enzymes which detoxify many environmental toxicants and drugs. Studies on lead effects on kidney found that large increases in these enzymes occurred at lead levels seen in the environment of exposed persons and they preceded pathobiological ...

An Experimental and Numerical Study of the Effects of Design Parameters on Water Mist Suppression of Liquid Pool Fires Apr 30, 1999 32 pages

Authors: Chuka C. Ndubizu; Ramagopal Ananth; Patricia A. Tatem; Kuldeep Prasad; Chiping Li; NAVY TECHNOLOGY

CENTER FOR SAFETY AND SURVIVABILITY WASHINGTON DC

Full Text

This report presents the results of an experimental and numerical parametric study of water mist suppression of liquid pool fires. The numerical part was conducted with small 2-D methanol pool fire, while the experiments were conducted with a 50 cm diameter pan heptane and JP8 pool fires. Analyses of results of the experimental and numerical parts lead to similar conclusions. First, the results show that base injection of droplets enhanced their suppression effectiveness by as much as two times compared to top injection. This is because the droplets evaporated within the lower region of the ...

Development of a Clean Air Fire Training Fuel Feb 1994 95 pages

Authors: J. B. Mitchell; M. E. Moir; UNIVERSITY OF WESTERN ONTARIO LONDON DEPT OF PHYSICS

Full Text

This report describes a series of tests involving the measurement of emissions from six feet diameter fires of JP4, JP5, JP8 and a new clean burning fuel CD2022 with smoke reducing additive. Emissions were also measured while AFFF, dry chemical and Halon 1211 were introduced into the fires. A number of large scale (100 feet diameter) fires were also conducted and extinguishment of the new fuel was tested. jg

Oxidative Stress, Signal Transductions, Cell-Cell Communication Feb 27, 1997 9 pages

Authors: James E. Trosko; MICHIGAN STATE UNIV EAST LANSING COLL OF HUMAN MEDICINE

Full Text

The objective of this research project was to study the mechanisms by which non-genotoxic or epigenetic chemicals induce multiple disease endpoints such as birth defects, tumor promotion, reproductive and neurotoxicities. The purpose is to develop a 'biologically-based' risk assessment model for human exposure to this class of toxic chemicals. The working hypothesis to have been tested was non-genotoxic chemicals disrupted homeostatic control of cell proliferation, differentiation and adaptive responses of differentiated cells. Three specific aims were designed to be tested (e.g., test a ...

Characterization of Emissions from Heaters Burning Leaded Diesel Fuel inUnvented Tents Jul 1998 23 pages

Authors: Yung Sung Cheng; LOVELACE BIOMEDICAL AND ENVIRONMENTAL RESEARCH INST ALBUQUERQUE NM

Full Text

The purpose of this study is to simulate human exposure to aerosols produced by unvented heaters in tents used in the Persian Gulf, so that the contribution of exposure to this in-tent pollutant can be estimated. The specific aims include: 1. Physical and chemical characterization of aerosols produced by heaters that burned fuels in an unvented tent. 2. Estimation of exposure to particulate matter (PM), combustion gases (such as CO, NOx, and SO2) , and other compounds (such as lead, PAHs etc.). During the first year of the project, we had extensive discussions with several Army ...

Survey of Jet Fuels Procured by the Defense Energy Support Center Jun 9, 1998 77 pages

Authors: DEFENSE ENERGY SUPPORT CENTER FORT BELVOIR VA

Full Text

This first report is a compilation of data which are representative of the quality of jet fuels (JP4, JP5, and JP8) purchased by the Defense Energy Support Center (DESC) worldwide. This information was obtained from our Petroleum Quality Information System (PQIS), an automated system which contains product quality history. This database contains over 6000 records of aviation fuel deliveries, which represents 8.5 billion gallons of product. The data contained in this report are summarized to provide statistical information on average, minimum and maximum values of selected test properties for ...

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 currently contains 4,385 records, representing just under 6.8 billion gallons of product, starting from January 1, 1995. Many DESC personnel contributed to its development, maintenance and data entry functions. Special thanks go to the field offices of DCMD and DCMDI for their response in providing information for shipments that were missing from the ...

Detonability of Hydrocarbon/Air Mixtures Using Combustion Enhancing Geometries for Pulse Detonation Engines Jun 2001 77 pages

Authors: Neil G. Sexton; NAVAL POSTGRADUATE SCHOOL MONTEREY CA SOFTWARE ENGINEERING AUTOMATION CENTER

Full Text

This research studied combustion enhancing geometries and shock reflection on generating a hydrocarbon/air detonation wave in a combustion tube. Ethylene was used as a baseline fuel to determine the preferable geometries. Propane was then used in later testing because of its combustion similarities with heavy hydrocarbon fuels such JP5, JP8, and JP10. Three criteria were used to measure the effectiveness of the combustion enhancing geometries: ability to generate a detonation, wave speed, and time for shock formation. The evaluated geometries included flow-restricting orifice plates and a ...

Adaptation of Advanced Diesel Engines for Military Requirements Under Severe Environmental Conditions Oct 15, 2004 76 pages

Authors: Naeim A. Henein; Dinu Taraza; Nabil Chalhoub; WAYNE STATE UNIV DETROIT MI DEPT OF MECHANICAL ENGINEERING SCIENCES

Full Text

The overall goal of this program is to adapt commercially produced heavy duty diesel engines to meet the goals the military engines for maximum power, better fuel economy, and low signature in the field by white or black smoke and compactness for mobility. The commercial advanced heavy-duty diesel engines are produced to meet stringent emission standards, causing penalties in peak power and fuel economy. This project addressed three major thrust areas. The first area is to determine the effect of replacing the commercially available fuel with JP8

fuel. The second area is to examine the ...

Evaluation of Ahura's First Defender Handheld Chemical Identifer Jan 2006 55 pages

Authors: Robin L. Matthews; Kwok Y. Ong; Christopher D. Brown; Leyun Zhu; Kevin Knopp; EDGEWOOD CHEMICAL BIOLOGICAL CENTER ABERDEEN PROVING GROUND MD

Full Text

The handheld Raman spectrometer for point detection of chemicals developed by Ahura Corporation was tested using chemical warfare agents (CWAs). The device was assessed for its capacity to detect and identify liquid through sealed glass containers in a completely non-contact, non-destructive manner. The CWAs tested included the following: mustard (HD), nitrogen mustard (HN1 and HN3), VX, tabun (GA), sarin (GB), and lewisite (L). Detection characteristics were examined for neat agents, as well as detection in the presence of interferences (JP8 jet fuel, aqueous film forming foam, Windex, and ...

Evaluation of Ahura's Firstdefender Handheld Chemical Identifier Jan 2006 54 pages

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Predicting the Liquid Lengths of Heavy Hydrogen Fuels Aug 30, 2003 13 pages

Authors: Laura L. Hoogterp; TACOM RESEARCH DEVELOPMENT AND ENGINEERING CENTER WARREN MI

Full Text

The purpose of this paper is to outline the procedure used in determining the liquid lengths in diesel fuels. Using models formulated by previous researchers as well as the thermodynamic properties for three fuel surrogates the liquid length can be determined for diesel fuel, JP8 as well as provide a model for fuels between these ranges. This information is to later be used to develop a computer program to perform these calculations on engines running in a test cell.

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 ... called Surrogate C are selected for consideration as possible surrogates of **JP-8**. Experiments under nonpremixed conditions are carried out employing the counterflow configuration. The fuels tested are **JP-8** and the Aachen surrogate. Critical conditions of ... are found to be similar to those in flames burning **JP-8**. Numerical calculations are performed using the chemical ... other duct. Critical conditions of extinction are measured for **JP-8**, Aachen surrogate and Surrogate C. The measured ...

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