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Green Gasoline

By Moraima Lugo-Millán, Chemist, HTIS

"Going green" is an expression that has involved the entire nation in an attempt to create a plan that increases environmentally friendly products and services. The intention is to manage, replace, and reduce the use of chemicals that can cause harm to human health and the environment. Strategies to develop and use eco-friendly products are joint efforts between the government, private industries, universities, manufacturers, and consumers. Among the different efforts and with the endless increasing oil prices, the entire nation is taking a serious look at alternative fuel sources.

Although significant investments have been made in technologies for the production of ethanol from corn, biodiesel from soybean oil or canola oil, and more recently for the conversion of nonfood biomass feedstocks into ethanol and biodiesel, to date, the technologies for producing hydrocarbon fuels such as gasoline, diesel and jet fuel from biomass seem to have been overlooked. However, this will likely change, with recent reports of advancements in green gasoline production from scientists and engineers associated with different universities throughout the United States and government laboratories. These researchers are preparing to scale-up their approach to the production of green gasoline in the next year or two.

Researchers have developed a liquid identical to standard gasoline from sustainable biomass sources such as switchgrass, poplar trees, sugar, and other carbohydrates. They ensure that sugars and other carbohydrates can be

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processed like petroleum into the full suite of products that drive the fuel, pharmaceutical and chemical industries. During the process, sugar is converted into molecules that can be processed into gasoline, diesel and jet fuel. In the process cellulose is heated in the presence of solid catalysts and then the resulting product is rapidly cooled to create an organic oil-like solution, which contains molecules of acids, alcohols, ketones, and cyclics that are precursors to fuel. The entire process is completed in approximately two minutes using moderate amounts of heat. According to researchers this process, in theory, requires much less energy to make than ethanol, giving it a smaller carbon footprint and making it less expensive to produce. Also using cellulose sources such as switchgrass or poplar trees grown as energy crops, or forest or agricultural residues such as wood chips or corn stover, solves the lifecycle greenhouse gas problem that has recently surfaced with corn ethanol and soy biodiesel.

Alternative fuels such as bioethanol and biodiesel are exciting developments that could go a long way toward resolving our dwindling fossil fuel supplies. Recent experiments and findings promise a product that is compatible with existing infrastructure, closer than many other alternatives in their net energy yield and, most important, is derived from agricultural waste and non-food plants. Although transportation efforts are focused to reduce the use of gasoline in cars with the development of hybrid-electric vehicles, high energy-density gasoline, diesel and fuel, will still be needed for jets, airplanes, trains, trucks, boats, and other applications. Green gasoline is not only a compact way to treat a great deal of biomass in a short period of time to produce fuel, but the extra heat that will be released in the process can be used to generate electricity.

Green gasoline approaches are generating interest across the academic and industrial communities. Researchers are working hard in their efforts to understand the chemistry of this process and are designing new catalysts and reactors for this single step technique to accelerate the commercialization of green gasoline. According to chemical engineers involved in the research and development of green gasoline, biofuels in the future will be very similar in chemical composition and efficiency to gasoline and diesel fuel used today. The National Science Foundation and the Department of Energy, along with other federal agencies, are sponsoring and promoting the green gasoline efforts in order to find a practical solution to the impending fuel crisis.

Reference: 1. http://www.nsf.gov/news/news_summ.jsp?cntn_id=111392
2. http://www.nsf.gov/news/news_summ.jsp?cntn_id=112256&govDel=USNSF_51
3. http://www.news.wisc.edu/15627

Erratum

In the article "**EPA Approves R-152a as a Motor Vehicle Refrigerant**", on **page 6 of the September-October 2008 HTIS Bulletin** there is an error. While it is true that HCF-134a as a mobile refrigerant is being phased out in much of Europe (EU) for new motor vehicles, because 134a is a hydrofluorocarbon (HFC) and not a hydrochloro fluoro arbon (HCFC). However, there is no nationally mandated phase-out for HFC-134a in

the US at this point. Industry observers are, however, watching potential legislative and regulatory moves in California that may affect the use and availability of HFC-134a there.

HTIS regrets the inconveniences that this error may have caused.

Lead in Artificial Turf

Reprint submitted by Beverly Howell, HTIS

Recent tests by the New Jersey Department of Health and Senior Services (NJDHSS) on artificial turf playing fields in New Jersey have found that those fields contain potentially unhealthy levels of lead dust. The initial tests were conducted on a limited number of playing fields. NJDHSS sampling of additional athletic fields and other related commercial products indicates that artificial turf made of nylon or nylon/polyethylene blend fibers contains levels of lead that pose a potential public health concern. Tests of artificial turf fields made with only polyethylene fibers showed that those fields contained very low levels of lead.

Information provided by NJDHSS to CDC and ATSDR indicates that some of the fields with elevated lead in either dust and/or turf fiber samples were **weathered and visibly dusty.** Fields that are old, that are used frequently, and that are exposed to the weather break down into dust as the turf fibers are worn or demonstrate progressive signs of weathering, including fibers that are abraded, faded or broken. These factors should be considered when evaluating the potential for harmful lead exposures from a given field.

The risk for harmful lead exposure is low from new fields with elevated lead levels in their turf fibers because the turf fibers are still intact and the lead is unlikely to be available for harmful exposures to occur. As the turf ages and weathers, lead is released in dust that could then be ingested or inhaled, and the risk for harmful exposure increases. If exposures do occur, CDC currently does not know how much lead the body will absorb; however, if enough lead is absorbed, it can cause neurological development symptoms (e.g. deficits in IQ). Additional tests are being performed by NJDHSS to help us better understand the absorption of lead from these products.

General Recommendations on the Use of Fields with Artificial Turf

At this time, CDC does not yet understand the potential risks associated with exposure to dust from worn artificial turf. The following precautions can be taken to minimize any potential risk:

- Field managers should consider implementing dust-suppression measures. Suggestions for dust-suppression methods can be found at http://www.nj.gov/health/artificialturf/

- Children ages 6 and younger are most susceptible to lead's harmful health effects. To protect the public, in particular young children, consider posting signs indicating that:

  1. After playing on the field, individuals are encouraged to perform aggressive hand and body washing for at least 20 seconds using

soap and warm water.

2. Clothes worn on the field should be taken off and turned inside out as soon as possible after using the field to avoid tracking contaminated dust to other places. In vehicles, people can sit on a large towel or blanket if it is not feasible to remove their clothes. These clothes, towels, and blankets should be washed separately and shoes worn on the field should be kept outside of the home.

3. Eating while on the field or turf product is discouraged.

4. Avoid contaminating drinking containers with dust and fibers from the field. When not drinking, close them and keep them in a bag, cooler, or other covered container on the side of the field.

General Lead Poisoning Prevention Recommendations

Especially in houses where children are present, parents, day care providers and other child care providers should follow lead safety practices regardless of the type of playing surface. The following practices can help prevent children from being exposed to the many sources of lead in the environment:

- Wash children's hands frequently and always before they eat.
- Do not eat food or use pacifiers that have been dropped on the floor or outside.
- Remove shoes when entering the house or use door mats.
- Have your house inspected for lead if it was built before 1978.
- Use lead-safe work practices when doing work that disturbs lead-painted surfaces.

Lead Testing of Artificial Turf Fields

Facility managers who choose to have the turf at a field tested for lead should contact their local or state department of health and/or environment about appropriate sample collection and analytic methods. CDC and ATSDR recommend using appropriate U.S. Environmental Protection Agency, National Institute for Occupational Safety and Health, or American Society for Testing and Materials methods.

The CDC has also issued the following recommendations for turf field owners and/or managers:

- Test turf that has fibers that are abraded, faded or broken, contains visible dust, and that is made from nylon or nylon-blend fibers.
- If the dust contains more than 400 ppm lead, do not allow turf access to children under the age of 6 years.
- If access is restricted, care should be taken to ensure that alternative sites contain lead levels less than 400 ppm.

- Do not test turf made from polyethylene-only fibers. This recommendation is based on currently available data.

- Do not test turf made from nylon or nylon blends that is not worn and does not contain visible dust. But these fields should be routinely monitored for wear and dust generation.

- Replace fields as soon as practicable if worn and dusty, as a precautionary measure.

Army Actions

After becoming aware of this health concern, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) launched an investigation to identify Army sites where artificial turf is used. Additionally USACHPPM has developed a "Just the Facts" document titled Guidance on Lead in Artificial Turf. That document can be accessed at: http://chppm-www.apgea.army.mil/documents/LeadArtificialTurfGuidFSAug08.pdf

References: 1. Department of Health and Human Services, Centers for Disease Control and Prevention, "Potential Exposure to Lead in Artificial Turf, June 19, 2008. 2. Department of Health and Human Services, Centers for Disease Control and Prevention, CDC Health Advisory, "Potential Exposure to Lead in Artificial Turf: Public Health Issues, Actions, and Recommendations', June 18, 2008. 3. State of New Jersey, Department of Health and Senior Services "Updated Lead and Artificial Turf Fact Sheet, August 2008", http://www.state.nj.us/health/artificialturf/documents/turf_factsheet_update_aug08.pdf, August, 2008. 4. U.S. Army Center for Health Promotion and Preventive Medicine, Guidance on Lead in Artificial Turf, Fact Sheet No. 55-016-0808.

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Federal Installations in California Eligible for a Wide Array of Rebates When Purchasing Energy-Efficient Products

By Steve Perez, Management Analyst, Green Procurement Program, DSCR

According to the Food Service Technology Center California, utility customers including US Government installations are eligible for a wide variety of cash rebates when they purchase and install qualifying energy-efficient appliances, fixtures or materials.

Many of the qualifying products are identified by their EPA Energy Star rating and are available through the federal supply system. For other products a specification sheet must be reviewed to ensure that the product being installed is eligible for the rebate.

Some examples of qualifying energy-saving products include:

- Energy Star Ice Machines,

- High Efficiency Clothes Washers and Dishwashers,

- Advanced Evaporative Coolers,
- Energy Star Room Air Conditioners,
- Compact & Linear Fluorescent Lighting Fixtures, and
- Room Occupancy Sensors.

Examples of energy efficient materials include wall and ceiling insulation and thermal window film.

Program Details can be found at: http://www.fishnick.com/saveenergy/rebates/

Participating California Utilities include:

- Pacific Gas & Electric - http://www.pge.com/index.html
- Southern California Edison http://www.sce.com/
- Southern California Gas - http://www.socalgas.com/index/
- San Diego Gas & Electric - http://www.sdge.com/index/

The Defense Logistics Agency helps its customers identify and purchase Green Products in various ways. Green Products are clearly identified in the DOD EMALL at http://www.emall.dla.mil/. Green Products display a tree icon and a two-character Environmental Attribute Code (ENAC) which assures the purchaser that the item meets objective criteria to be considered an environmentally preferable product.

DLA customers can email questions or comments to the DSCR Green Products team at GreenProducts@dla.mil or fill out a simple web form at: http://www.dscr.dla.mil/userweb/aviationengineering/BUY_GREEN/buygreen_form.asp

DOD News

GAO Review's DOD's Chemical Demil Program

By Tom McCarley, Chemist, HTIS

Getting rid of the world's buildup of lethal nerve, blister, and other chemical agents is a most daunting task which the US and other countries have been attempting over the past several decades. Destruction protocols needed to be developed and then tested and then very expensive plants developed to carry out the destruction of tons of agent stockpiled over the years. Since such destruction ventured into the unknown, it may not be surprising that the costs and timelines would exceed initial estimates.

In a 93 page report available at http://www.gao.gov/new.items/d08134.pdf, the Government Accountability Office (GAO) indicated that additional work, especially in the area of management action, is needed. The report is entitled "Chemical Demilitarization – Additional Management Actions Needed to Meet Key performance Goals of DOD's Chemical Demilitarization Program" The report makes 13 recommendations in its October 3, 2007 draft:

1. Recommend that the Secretary of Defense direct the Secretary of the Army to take the following three actions:

- incorporate baseline and trend data for past performance and multiyear

performance goals for the future in its annual performance plan;

- develop interim destruction goals, approaches, and milestones that are directly linked to overall program goals for meeting CWC deadlines; and

- establish a time frame for completing and implementing its risk management approach, including integration across sites and with DOD. To provide more realistic cost estimates for chemical demilitarization sites in light of recent experience and information gained

2. Recommend that the Secretary of Defense direct the Secretary of the Army to update the 2005 program schedule milestones for each of DOD's chemical demilitarization sites to reflect recent site processing rates and then adjust the cost estimate accordingly.

3. Recommend that the Secretary of Defense direct the Chemical Analysis Improvement Group (CAIG) to establish a periodic schedule to review the program's processing history to determine whether the schedule milestones are still reasonable.

4. Recommend that Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology, and Logistics to include in the Chemical Demilitarization Program's Acquisition Program Baseline and Selected Acquisition Report the updated and reviewed schedule milestones for completing destruction operations and facility closure activities for each of the chemical agent destruction sites.

5. Recommend that the Secretary of Defense direct the Secretary of the Army to take the following three actions:

- coordinate with the systems contractors in defining closure requirements and developing accurate and realistic closure cost estimates for each of DOD's chemical demilitarization sites.

- define all contract requirements, including authorized unpriced work associated with facility closure activities, and develop comprehensive cost estimates through closure at each chemical destruction site; and

- establish a time frame for completing the negotiation for placing all authorized work that has not been priced on contract and ensuring that the negotiations take place.

6. Recommend that the Secretary of Defense direct the Cost Analysis Improvement Group to conduct an independent cost review of the cost estimates.

7. Recommend that the Secretary of the Defense direct the Secretary of the Army to determine for each of the four incineration site contracts whether greater weight can be applied to performance measures, such as schedule and cost, in award fee plans to further incentivize the systems contractors to increase the destruction

rate of chemical agents in a safe and environmentally sound manner.

8. Recommend that the Secretary of Defense direct the Secretary of the Army to take the following two actions:

- better align its award fee policy with DOD's March 2006 guidance on award fees and

- link more of its award fee criteria to performance measures that focus on identifiable interim outcomes, discrete events, or milestones.

The report indicates that DOD agreed or at least partially concurred with 12 of the 13 recommendations. DOD did not concur with recommendation #7 dealing with closure cost estimates saying that recommendation #9 is more encompassing.

Reference: Government Accountability Office report: "Chemical Demilitarization – Additional Management Actions Needed to Meet Key performance Goals of DOD's Chemical Demilitarization Program", GAO-08-134, December 2007, 93pp, http://www.gao.gov/new.items/d08134.pdf

DOT News

PHMSA's Annual Clean-up Rulemaking

By Muhammad Hanif, Chemist, HTIS

On October 1, 2008, the Pipeline and Hazardous Materials Safety Administration (PHMSA) of U.S. Department of Transportation (DOT) published its annual clean–up rulemaking of the hazardous materials regulations (49 CFR 171-180) in the Federal Register (FR), Vol. 73, pages 57001 – 57008 (73FR57001). The intent of the rule is to make minor rulemaking changes, correct editorial errors and provide clarification to the regulations to improve the clarity of certain provisions of the Hazardous Materials Regulations (HMR).

Significant components of the final rule include:

- Replacing the definition of "Diagnostic specimen" with "Biological substance, category B" in appropriate alphabetical order at 49 CFR 171.8. This was an oversight during the harmonization rulemaking for infectious substances under Docket No. PHMSA-2004-16895 (HM-226A; 71FR 32244, June 2, 2006). Also, revising the definitions for "Elevated temperature material" and "Liquid phase" to specify the metric conversion of 100 ^{o}F as 38 ^{o}C for consistency throughout the HMR.

- Adding clarification language to 49 CFR 171.25(b)(1) to state that the segregation requirements in part 7 of the IMDG Code may be utilized for both rail and highway shipments. PHMSA had inadvertently excluded the rail mode of transportation in printing of the HM-215 (72 FR 25161) final rule on May 3, 2007. Also, clarifying in paragraph (b)(2) of 49 CFR 171.25

that the paragraph applies to transportation by vessel.

- Revising the shipping paper description requirements at 49 CFR 172.201 to clarify that the use of an "X" in a column titled "HM" must precede the **basic shipping description** and **NOT the proper shipping name (PSN).** This change was made to reflect the sequence of the basic shipping description recognized at 49 CFR 172.202(b).

- Revising the additional shipping paper description requirements to reflect in the example at 49 CFR 172.203(c)(2) the basic shipping description sequence prescribed in 49 CFR 172.202(b), and to correct the example of the basic description for "Allyl alcohol" by stating that this material is a Zone B toxic inhalation hazard. **Note**: the basic shipping description specified in 49 CFR 172.201(a) **must be shown in sequence of** UN identification number, PSN, hazard class or division number, and packing group without additional information interspersed.

- Revising the additional shipping paper description requirements at 49 CFR 172.203(i)(2) for flammable liquids transported by vessel, to reflect a flash point at 60 ^{o}C (140 ^{o}F) in place of 61 ^{o}C for consistency with the provisions contained in 49 CFR 173.120(a) and paragraph 5.4.1.4.3 of the IMDG Code.

- Adding clarification language at 49 CFR 172.203(k) to refer readers to the definition of "Technical name" at 49 CFR 171.8 and to other relevant information described in 49 CFR 172.301. Paragraph 172.203(k) describes the rules for other generic description information with the proper shipping names containing a letter "G" in Column 1 of the 172.101 Hazardous Materials Table.

- Revising the "Forbidden materials and packages" rule at 49 CFR 173.21(f)(3) to clearly state that approvals issued by the Bureau of Explosives are no longer valid.

- Removing the unneeded alternate marking language in the overpack rules specified at 49 CFR 173.25(a)(4). The option to use alternative language to the "OVERPACK" marking expired on October 1, 2007.

In a separate rulemaking on October 1, 2008, PHMSA also published some corrections in 73 FR

57008 to the Hazardous Materials Table at 49 CFR 172.101. The significant changes include:

1. Removing the entries:
   a. First entry for Amines, flammable, corrosive, n.o.s. or Polyamines, flammable corrosive, n.o.s. - UN2733; and
   b. Second entry for Lighters containing flammable gas - UN1057

2. Reinstating the entries at appropriate alphabetical order for:
   a. Amines, liquid,corrosive, flammable n.o.s. or Polyamines, liquid corrosive, flammable n.o.s. - UN2734 PG I above the second PG II entry in UN2733
   b. Calcium - UN1401
   c. Chromosulfuric acid - UN2240
   d. Organometallic substance solid, water reactive - UN3395

Both rules became effective October 1, 2008, in time to meet the codification deadline for Title 49 of the Code of Federal Regulations (CFR). The full texts of the final rules published in the Federal Register can be viewed at http://edocket.access.gpo.gov/2008/pdf/E8-22743.pdf and http://edocket.access.gpo.gov/2008/pdf/E8-23119.pdf respectively.

For information on specific aspects of the rule, contact Eileen Edmondson, Office of Hazardous Materials Standards, (202) 366–8553, PHMSA, East Building, PHH–10, 1200 New Jersey Avenue, SE., Washington, DC 20590

References: Federal Register (FR) volume 73, pages 57001 - 57008 (73FR57001) and, pages 57008 – 57010 (73FR57008), Wednesday, October 1, 2008.

EPA News

EPA Letter Says an MSDS can be Used in Making Hazardous Waste Determinations

By Tom McCarley and Abdul Khalid, HTIS

The hazardous waste regulations under the Resource Conservation and Recovery Act (RCRA) require that a generator of a "solid" waste determine whether or not that waste meet any of the criteria of a hazardous waste. Recall that "solid waste" in the regulatory sense can physically be a solid, sludge, liquid, or even a contained gas. 40 CFR 262.11(c) tells us that such a waste determination can be made by actually testing the waste or by applying generator knowledge. Of course, analytical test results are, in most cases, quantitative and probably preferred by the vast majority of regulators. But analytical testing is not cheap.

A material safety data sheet (MSDS) for the unused product that ends up as waste is often the best document available showing the properties and hazards of the material. Can an MSDS be used as part of "generator knowledge"? A recent interpretative letter from the EPA's Office of Solid Waste now says yes – an MSDS can be used. The June 6, 2008 letter from Matt Hale, Director of EPA's Office of Solid Waste to Michael Beckel of 3E Company can be accessed at RCRAOnline at: http://yosemite.epa.gov/osw/rcra.nsf/0c994248c239947e85256d090071175f/78EB7B6010F3FAA38525748100531CBC/$file/14790.pdf

In the letter, the EPA acknowledged that an MSDS is often the only information available to determine the chemical components of a product.

The reader is cautioned, however, on several points:

- An MSDS is created pursuant to the worker right-to-know hazard communication standard requirements of the Occupational Safety and Health Administration (OSHA) – 29 CFR 1910.1200. As such, the EPA which regulates waste, does not dictate the preparation and content of an MSDS.

- A preponderance of MSDSs reflect unused products; and MSDSs are not created or required for waste materials. The properties and hazards of a material may be altered significantly during the waste-creating process.

- There is no requirement that every ingredient be listed on an MSDS or that the exact percentage content of an ingredient be listed or that the total of ingredient content add up to 100%. The exact identity of an ingredient/ingredients may be considered proprietary business information.

- All States except for Alaska and Iowa operate their own hazardous waste programs; and use of an MSDS as the "source" of generator knowledge may not be acceptable for waste characterization.

Reference: EPA OSW Letter of Interpretation, Hale to Beckel, June 8, 2008 at RCRAOnline http://yosemite.epa.gov/osw/rcra.nsf/0c994248c239947e85256d090071175f/78EB7B6010F3FAA38525748100531CBC/$file/14790.pdf

National Lead Free Wheel Weight Initiative

Reprint submitted by Beverly Howell and Abdul Khalid, HTIS

Tire companies, big box stores, and the government are putting the brakes on the use of lead wheel weights. Through the EPA's National Lead-Free Wheel Weight Initiative (NLFWWI), partners have agreed to phase-in the use of lead-free alternative wheel weights and **reduce the amount of lead released into the environment by 2011.**

"Our partners have pledged to reduce or eliminate their use of lead wheel weights," said Susan Parker Bodine, assistant administrator of the EPA's Office of Solid Waste and Emergency Response. "Their efforts will remove millions of pounds of lead from the environment and the waste stream."

Eliminating lead wheel weights is a significant step toward reducing the overall amount of lead released into the environment. The EPA estimates that 50 million pounds of lead per year are used for wheel weights in cars and light trucks. It is common for wheel weights to come off when a vehicle hits a pothole in the road or stops suddenly, which results in lead entering the environment. Lead-containing wheel weights also add lead into the environment as they move into the waste stream at the end of product life.

Wheel weights are clipped to the rims of every automobile wheel in the

United States in order to balance the tires. These weights often come loose and fall off. They are either washed into storm sewers and end up in waterways or are gathered during street cleaning and placed in municipal landfills. The weights are susceptible to atmospheric corrosion. **Currently, there are no regulatory controls governing the use of lead wheel weights.**

"To encourage the transition away from the use of lead for wheel weights, the US EPA has created an opportunity for entities engaged in the manufacture, distribution, sale and use of wheel weights to participate in a **voluntary** effort to accelerate this transition. To operationalize this concept, the EPA is creating the NLFWWI. By participating in this initiative, organizations are taking one step toward achieving the phase-out of the sale and installation of lead wheel weights. U.S. EPA encourages the pursuit of additional activities designed to achieve an accelerated transition away from the use of lead wheel weights. Organizations participating in the NLFWWI intend to:

- Identify the volume of lead to be eliminated;
- Reduce the use of lead for wheel weights by December 31, 2011;
- Take responsibility for providing information, education, and outreach to the public, regarding the benefits of using lead-free wheel weights;
- Properly collect and recycle used lead wheel weights in their current inventory or acquired through normal business operation; and
- Publicly endorse the NLFWWI and encourage the use of lead free wheel weights by others.

Reference:
http://www.epa.gov/epawaste/hazard/wastemin/nlfwwi.htm

NFS and EPA Establish Two Centers for the Environmental Implications of Nanotechnology

Reprint submitted by Ariel Rosa, HTIS

The centers will focus on strengthening our nation's commitment to research on the environmental, health and safety implications of nanomaterials."

19 Sep 2008 - The National Science Foundation (NSF) and the U.S. Environmental Protection Agency (EPA) awarded $38 million to establish two Centers for the Environmental Implications of Nanotechnology (CEIN). EPA contributed $5 million to the overall award, which is the largest award for nanotechnology research in the Agency's history. The centers, led by UCLA and Duke University, will study how nanomaterials interact with the environment and with living systems and will translate this knowledge into risk assessment and mitigation strategies useful in the development of nanotechnology.

"The new centers will provide national and

international leadership in the emerging field of environmental nanoscience," said Arden L. Bement, Jr., NSF director. "This is an important addition to the National Nanotechnology Initiative, and builds on earlier discoveries on the environmental implications of nanotechnology made since 2001, when NSF's Center for Biological and Environmental Nanotechnology was established. The new centers are aimed at strengthening our nation's commitment to research on the environmental, health and safety implications of nanomaterials."

The centers will work as a network, connected to other research organizations, industry and government agencies and will emphasize interdisciplinary research and education. Their challenge is to better integrate materials science and engineering with molecular, cellular, organismal and ecological biology and environmental science.

"The collaborative approach that these centers will use is key to quickly building the scientific foundation for understanding the health and environmental implications of nanomaterials," said George Gray, EPA assistant administrator for research and development. "This comprehensive research model promises to augment the knowledge we need to be good stewards of the environment."

The UCLA CEIN, to be housed at the California NanoSystems Institute on the UCLA campus, will explore the impact of nanomaterials on the environment and on interactions with biological systems at all scales from cellular to ecosystem. The model to be developed will consider: which nanomaterials are most likely to come into contact with the environment, which animals/plants can act as early sentinels of environmental changes, and high throughput methods to screen many chemicals quickly.

At the Duke University CEIN, researchers plan to define the relationship between a vast array of nanomaterials, from natural to man-made to incidental, byproduct nanoparticles, and their potential environmental exposure, biological effects and ecological consequences. Nanomaterials that are already in commercial use as well as several present in nature will be among the first materials studied. In the coming year, the research team will develop 32 tightly controlled and monitored ecosystems in Duke Forest in Durham, N.C. Known as "mesocosms," these living laboratories provide areas where researchers can add nanoparticles and study the resulting interactions and effects on plants, fish, bacteria and other elements.

Traditional toxicity testing relies mainly on a complex set of whole-animal-based toxicity testing strategies. "This approach cannot handle the rapid pace at which nanotechnology-based enterprises are generating new materials and ideas," said Nel, who is also the Director of the UC led-Campus Nanotoxicology Research and Training Program at UCLA. "The CEIN's development of a comprehensive computational risk ranking will allow powerful risk predictions to be made by and for the academic community, industry, the public, and regulating agencies."

Reprint Courtesy: National Science Foundation.

Reference:
epa.gov/ncer/08CEIN and www.nfs.gov/

OHSA News

OSHA Interpretation of Recordkeeping Regulations for Working from Home While Recuperating From Surgery

By Abdul H. Khalid, Chemical Engineer, HTIS

On August 26, 2008, the Occupational Safety & Health Administration (OSHA) issued a letter of interpretation pertaining to working from home, after surgery, while recuperating from surgery in reference to 29 CFR Part 1904-Recording and Reporting Occupational Injuries and Illnesses.

In this case an employee suffered injuries to her knee in an accident while performing some clerical work. The employee had out-patient surgery one month after the knee injury and was released by her doctor with a restriction that the employee work from home. The employer allowed the employee to work from home while recuperating from surgery, but the employee did not work the full eight hours work day. OSHA in a letter of interpretation stated that because the employer had made a decision that the employee could not work in the office and allowed her to work at home during recovery. OSHA says that those days should be recorded as "days away from work".

For details on this interpretation letter and on OSHA's injury and illness recordkeeping rule, DOD personnel can visit OSHA's web site at: http://www.osha.gov/recordkeeping/entryfaq.html or call toll-free phone at 1-800-321-OSHA (6742) if you have workplace safety and health related questions.

Reference: OSHA's letter of Interpretation, August 26, 2008, website at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=27154

OSHA Establishes New National Emphasis Program for Lead

By Ariel Rosa, Environmental Protection Specialist, HTIS

OSHA issued directive, CPL 03-00-009 that implements a National Emphasis Program (NEP) to reduce occupational exposures to lead.

This document supersedes the previous 2001 OSHA NEP on Lead (CPL 02-00-130). Appendix A of this document contains a list of industries included to assist OSHA's field offices in determining industries for targeting. OSHA said that the data for this appendix were provided by NIOSH under the Adult Blood Lead Epidemiology and Surveillance Program for the calendar year 2002. OSHA has analyzed this data to determine those industries where elevated blood lead levels indicate a need for increased focus in evaluation of airborne lead exposures.

The NEP created by the new directive is implemented to direct the OSHA's field inspection efforts to address lead exposures in the workplace, including General Industry (1910), Construction (1926), Shipyards (1915), Longshoring (1918), and Marine Terminals (1917). These efforts meet the agency's strategic plan goals addressing the requirements of the Government Performance and Results Act (GPRA). As a result of this act, Federal agencies must demonstrate improved performance and devise a

system for measuring results. As stated in the DOL's Strategic Plan 2006-2011, "DOL will continue to direct inspections and outreach at establishments and industries with the highest injury, illness, and fatality rates and will respond to complaints of serious workplace hazards. These efforts will be supplemented by National and Local Emphasis Programs designed to target unsafe conditions or high hazard industries." The reduction of occupational illnesses and employee exposures to lead continues to be one of the OSHA's goals

Under this NEP, OSHA will direct resources towards inspections of industries in which lead exposures occur. Subsequent to an initial inspection, follow-up site visits will be conducted in all establishments where exposures were measured at or above the permissible exposure limit (PEL) or above the action level where the employer has not taken preventive/corrective action (as required by the standard).

Employee exposure to airborne lead will be sampled, whenever possible, during both the initial and follow-up inspection. Medical surveillance records will be reviewed, whenever available, by Compliance Officers during NEP lead inspections. In addition, during both the initial and follow-up inspections, Compliance Officers will evaluate training, use of personal protective equipment, surface concentrations of lead and the availability of hygiene facilities, work practices, and engineering controls.

You may review the complete directive (number CPL 03-00-009) at http://www.osha.gov/OshDoc/Directive_pdf/CPL_03-00-0009.pdf

OSHA's Letter Interpret the Recording and Reporting of Occupational Injuries and Illness

By Abdul H. Khalid, Chemical Engineer, HTIS

On September 3, 2008, the U. S. Occupational Safety & Health Administration (OSHA) issued an interpretation letter regarding the recording and reporting requirements referenced in 29 CFR Part 1904 for occupational injury and illness. This interpretation letter considers whether the injuries to employees on an employer's parking lot were "work-related injuries " under Section 29 CFR 1904.5 (b) (2) (vii) and recorded on the employer's company recording and reporting system.

According to OSHA, there were two separate incidents in which employees fell and injured themselves on a company's parking lot. OSHA considers these injuries work-related injuries that must be recorded on the company's recording and reporting system. The injured employees were given medical treatment and missed work days, therefore, the incidents must be recorded under the injury and illness recording and reporting requirements referenced in 29 CFR Section 1904. OSHA says an injury or illness must be considered work-related if an event or exposure in the work environment either caused or contributed to the injury or illness or significantly aggravated a pre-existing injury or illness, see http://pubs.bna.com/ip/bna/OSH.NSF/eh/a0b7a1a7p9

To apply an exception to the record keeping and reporting regulations, the employer must meet three conditions specified in Section 1904.5 (b) (2). OSHA clarified the three

conditions in its recent interpretation letter specified for exception. These conditions are when an employee is injured in a motor vehicle when the injury:

- Occurs during an employee's commute to and from work
- Occurs in the employer's parking lot or access road.
- Results from a motor vehicle accident.

In the interpretation letter OSHA concluded that injuries did not involve a motor vehicle accident as the third condition for Section 1904.5 (b) (2) (Vii), therefore, the employer must record these accidents on the company recording and reporting system.

OSHA issued new requirements for the recording and reporting of work-related injuries and illnesses for Federal agencies. Under the requirements, contained in 29 CFR Part 1960, Subpart I and 29 CFR 1904, Federal agencies will utilize the same injury and illness recording and reporting forms as required by the private sector. The final rule, "Recording & Reporting Occupational Injuries and Illness" became effective on January 1, 2005. OSHA allowed a one year implementation period for Federal agencies to comply with the rule which became effective on January 1, 2006. Federal agencies will utilize the injury and illness recordkeeping forms (1) OSHA Form 300-Log and (2) OSHA Form 300A-Summary of Work-related injuries and illnesses.

For information involving issues on rules and regulations or other matters, DOD personnel can call OSHA toll-free phone # 1-800-321-OSHA (6742) or write U.S. Department of Labor's (OSHA), 200 Constitution Avenue, N.W, Washington, D.C. 20210 or visit OSHA's web site at: http://www.osha.gov/

Reference: OSHA Interpretation Letter-Determination of Work-Related Occupational Injuries and Illnesses at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=27094

Other News

NRC and Army Corps of Engineers Update Environmental Review Cooperation

Reprint submitted by Moraima Lugo-Millán, HTIS

The Nuclear Regulatory Commission and the Army Corps of Engineers have revised their interagency agreement regarding environmental reviews for proposed nuclear power plants as well as significant actions at existing plants. The agencies will coordinate early in these reviews to ensure they share all the information necessary for carrying out their respective regulatory duties.

The NRC's licensing process ensures public health and safety, as well as the environment, are maintained during commercial use of nuclear materials, including nuclear power plants. The NRC takes the lead in meeting the National Environmental Policy Act's (NEPA) requirements during that process. The Corps protects U.S. waters and

wetlands through the provisions of the Rivers and Harbors Act of 1899 and the Clean Water Act, and administers permits for such purposes.

"We're now in a better position to work efficiently with the Corps as we come to our decisions on more than a dozen new reactor applications," said Bill Borchardt, the NRC's Executive Director for Operations. "The technical expertise both agencies bring to bear on these reviews means the public can be confident we'll reach accurate conclusions regarding these projects' potential environmental impacts."

"I'm pleased that this interagency agreement will improve the energy regulatory process and carry out the President's directives to facilitate America's energy independence while assuring the highest standards for environmental quality," said John Paul Woodley, Jr., Army Assistant Secretary for Civil Works.

Borchardt and Woodley signed the agreement, which lays out the two agencies' separate roles and agrees that the NRC's and the Corps' licensing and permit processes will start essentially simultaneously. The agreement names the NRC as the lead NEPA agency for preparing an environmental analysis on a proposed nuclear power plant. In this role, the NRC will strive to coordinate early with the Corps to address Clean Water Act permitting requirements. The Corps will complete an independent permit decision in carrying out its regulatory responsibilities. The agreement includes a process for resolving any instances where the two agencies disagree on a proposed plant's compliance with the agencies' respective rules.

Reference: http://www.nrc.gov/reading-rm/doc-collections/news/2008/08-177.html

Chemical and Toxicological Information at ChemIDPlus Advanced

By Tom McCarley, Chemist, HTIS

Those readers tasked with worker safety and occupational health responsibilities now have a data source on chemicals and their toxicity that is becoming ever more useful and is absolutely free. Known as ChemIDPlus Advanced, it is an evolution of the ChemID database of the National Library of Medicine (NLM). ChemIDPlus Advanced is accessed at http://chem.sis.nlm.nih.gov/chemidplus/ .

The ChemIDPlus Advanced has six major sections for searching:

- Substance Identification
- Toxicity
- Physical Properties
- Locator Codes
- Structure
- Molecular Weight

Of these sections, Substance Identification will be the most useful to most of us.

Locator codes are the original data sources at NLN where the chemical first appeared and is probably most useful to specialized librarians familiar with the many cancer and toxicology related databases from NLM. However, we do note that Wikipedia is included as a source.

Searching by toxicological tests would interest a toxicologist but not most

of us. And searching by physical properties, structure, or molecular weight is of interest to the chemist but even chemists will find substance identification searching the most useful. Those looking for a break from their computer routine, however, can click inside the structure search box which will pop up a molecular sketch pad for creating your own molecule; happy doodling !.

Those of us that work with material safety data sheets (MSDS) and the ingredients will find that searching by either the chemical name or name fragment or the Chemical Abstracts (CAS) registry number is the most useful under the Substance Identification portion. Once you get your results, you will find a wealth of information on the compound of interest. Input of the CAS number is the most direct route to your specific compound; just be sure that the drop down search box under Substance Identification is set to 'Registry Number' first.

Be careful when searching by part of a chemical name. Let's say you are looking for the common chemical toluene but were not sure how to spell it. Searching by TOL* (asterisk is the wild card) will yield nearly 600 hits and you may not see TOL anywhere in the displayed name. Rest assured if you click on full record, you will find the chemical name fragment of your search.

ChemIDPlus Advanced has some 382,100 records. Smaller subsets of these records will have toxicological data and physical property data which are pulled from other data sources.

Reference: ChemIDPlus Advanced at the National Library of Medicine - http://chem.sis.nlm.nih.gov/chemidplus/

Use of Certain Hazardous Substances under the RoHS EEE Directive

By Abdul H. Khalid, Chemical Engineer, HTIS

HTIS developed this article as the result of an environment, safety and occupational health (ESOH) technical inquiry. A DLA Distribution Depot requested ESOH information on (Microcircuit, Linear, NSN: 5962-01-089-8069) a DLA managed item. HTIS contacted the vendor and requested information on hazardous material for the part number (P/N) manufactured by Microsemi Company.

According to the Microsemi Company, the device contains lead (Pb) which is one of the Restriction of Hazardous Substances (RoHS) substances. The device has a tin-lead (Sn-Pb) solder lead finish. The package also utilizes a low temperature sealing glass which contains lead. MIL-PRF-38535 requires that any tin (Sn) solder on the exterior leads must contain lead.

The regulations of certain Hazardous Substances in Electrical and Electronic Equipment RoHS are also known as the lead-free directive (2002/95/EC**) that restricts the use of certain hazardous substances in electrical and electronic equipment (EEE).**

RoHS was adopted in February 2003 by the European Union (EU). The RoHS directive became effective on July 1, 2006 (2006 RoHS Regulations of electrical and electronic products). It is being enforced by each EU member state. All applicable products in the EU market should have become RoHS compliance

after July 1, 2006. The RoHS directive restricts the use of the following six substances:

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent chromium (CrVI)
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ethers (PBDE).

There are some exemptions for the use of hazardous substances for specific technical uses where alternatives or substitutes do not exist. There are permissible maximum concentration values that allow some traces of hazardous substances. RoHS EEE is a partner directive to the WEEE (Waste in electrical and electronic equipment) that controls the disposal and recycling of EEE.

These restricted hazardous materials are hazardous to the environment , pollute landfills, and are dangerous in terms of occupational exposure during manufacturing and recycling.

Portable analyzers, also known as X-ray fluorescence or XRF metal analyzers are used for screening and verification of RoHS compliance. For more information on 2006 RoHS regulations, visit RoHS web site at: http://www.ros.gov.uk/

Reference:
http://www.rohs.gov.uk/

The Staff at Hazardous Technical Information Services (HTIS), Eddie Alvarado, Idaglia Florez, Muhammad Hanif, Beverly Howell, Abdul Khalid, Leonard Lambert Moraima Lugo, Ariel Rosa, and Fred Tramontin, Thanks you for Using our services. We would also like to wish you A safe, Happy, And Enjoyable Holiday Season.

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