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In This Issue

Labeling Requirements for Biodiesel and Biomass-based Diesel

By Abdul H. Khalid, Chemical Engineering, HTIS

On July 11, 2008, the Federal Trade Commission (FTC) released its biodiesel and biomass-based diesel labeling requirements under Section 205 of the Energy Independence and Security Act of 2007 for "Automotive Fuel Ratings, Certification and Posting". The full text of this final rule is available online at: http://edocket.access.gpo.gov/2008/E8-15245.htm. This final rule will become effective on **December 16, 2008**.

The FTC provides the following examples to explain the application of the revised labeling requirements:

- A fuel blend containing five percent biomass-based diesel and five percent biodiesel does not require any additional labeling because the Rule only applies to diesel blends containing more than five percent biodiesel and/or more than five percent biomass-based diesel.

- A blend containing six percent biodiesel and five percent biomass-based diesel requires a blue label with either ``**B-6 Biodiesel Blend**" or ``**Biodiesel Blend**" in the header and with the text ``contains biomass-based diesel or biodiesel in quantities between 5 and 20 percent" below the

header. The header of the label does not disclose the presence of biomass-based diesel because it comprises only five percent of the fuel.

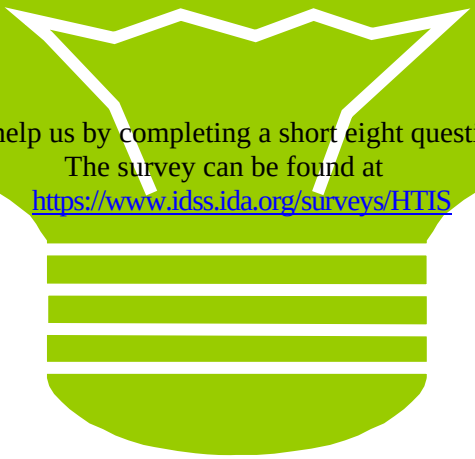
- A blend containing twenty-one percent biodiesel and five percent biomass-based diesel requires a blue label with ``**B-21 Biodiesel Blend**'' in the header and with the text ``contains more than 20 percent biomass-based diesel or biodiesel'' below the header. The header of the label does not disclose the presence of biomass-based diesel because it comprises only five percent of the fuel by volume. Furthermore, because the fuel contains only five percent biomass-based diesel, retailers should not include it for the purposes of determining the specific blend designation.

These labeling requirements will apply where diesel containing bio-mass based and bio-diesel blends are dispensed. For more information, DOD interested personnel can contact Matthew Wilshire, phone: 202-326-2976, or Hampton Newsome, phone: 202-326-2889, Division of Enforcement, Bureau of Consumer Protection, FTC, 600 Pennsylvania Avenue, N.W., Washington, D.C. 20580.

Reference: Federal Register, July 11, 2008, Vol. 73, No. 134, pages-40153-40165, web site at: http://edocket.access.gpo.gov/2008/E8-15245.htm

HTIS BULLETIN SURVEY

The Defense Logistics Agency (DLA) has published the HTIS Technical Bulletin for over 15 years in an effort to assist the DoD environmental, health and safety communities. Now we are conducting a survey to determine our readership and the relevance of what we write to our subscribers.



You can help us by completing a short eight question survey
The survey can be found at
https://www.idss.ida.org/surveys/HTIS

DOT News

Materials of Trade Exception

By Eduardo Alvarado, Chemical Engineer, HTIS

Materials of Trade (MOT) exception applies to the highway transportation of small quantities of hazardous materials, other than a hazardous waste, that are:

- Used to protect the health and safety of the motor vehicle operator or passengers.
- Transported to support operation or maintenance of a motor vehicle (including its auxiliary equipment).
- Used incidental to primary business that is not transportation.

When transported by motor vehicle in conformance with section 49CFR173.6, material of trade is not subject to any other requirements of Subchapter C, Hazardous Materials Regulations, besides those set forth or referenced in that section.

Allowable materials and limited amounts:

Class 3 (Flammable and combustible liquids)

Class 8 (Corrosive materials)

Class 9 (Miscellaneous materials)

Division 4.1 (Flammable solids, except self-reactive)

Division 5.1 (Oxidizers)

Division 5.2 (Organic peroxides)

Division 6.1 (Poisonous materials, other than gas, except poisonous by inhalation)

ORM-D limits

Not over 1 pound or 1 pint PG I.

Not over 66 pounds or 8 gallons for PG II, PG III, or ORM-D material.

Not over 400 gallons of a diluted mixture of a Class 9 material, not over 2% concentration.

Division 2.1 (Flammable gas)
Division 2.2 (Non-flammable gas)

In a cylinder with a gross weight not over 220 pounds, or a permanently mounted tank manufactured to the ASME Code of not more than a 70 gallon water capacity for a non-liquefied Division 2.2 material with no subsidiary hazard.

Division 4.3 (Dangerous when wet)

PG II or PG III in a packaging not to exceed 1 ounce gross capacity.

For exceptions to infectious substances, Division 6.2, consult regulations 49CFR173.6.

Packaging

- Packagings must be leak tight for liquids and gases, sift proof for solids, and be securely closed, secured against shifting, and protected against damage.
- Each material must be packaged in the manufacturer's original packaging, or a packaging of equal or greater strength and integrity.
- Outer packagings are not required for receptacles (e.g., cans and bottles) that are secured against

shifting in cages, carts, bins, boxes or compartments.

- For gasoline, a packaging must be made of metal or plastic and conform to the requirements of this subchapter or to the requirements of the Occupational Safety and Health Administration of the Department of Labor contained in 29 CFR 1910.106(d)(2) or 1926.152(a)(1).

- A cylinder or other pressure vessel containing a Division 2.1 or 2.2 material must conform to packaging, qualification, maintenance, and use requirements of Subchapter C, Hazardous Materials Regulations, except that outer packagings are not required. Manifolding of cylinders is authorized provided all valves are tightly closed.

Markings

A non-bulk packaging other than a cylinder (including a receptacle transported without an outer packaging) must be marked with a common name or proper shipping name to identify the material it contains, including the letters "RQ" if it contains a reportable quantity of a hazardous substance.

A bulk packaging containing a diluted mixture of a Class 9 material must be marked on two opposing sides with the four-digit identification number of the material. The identification number must be displayed on placards, orange panels or, alternatively, a white square-on-point configuration having the same outside dimensions as a placard.

Training

No hazardous material training is required; however, the operator of a motor vehicle that contains a material of trade must be informed of the presence of the hazardous material (including whether the package contains a reportable quantity) and must be informed of the requirements of this section.

Aggregate gross weight

Except for a diluted mixture of a Class 9 material, not over 2% concentration, the aggregate gross weight of all materials of trade on a motor vehicle may not exceed 440 pounds.

Compatibility

A material of trade may be transported on a motor vehicle under the provisions of section 49CFR173.6 with other hazardous materials without affecting its eligibility for exceptions provided by this section.

Reference: DOT 49CFR173.6.

EPA News

EPA Amends Hazardous Waste Code F019

By Muhammad Hanif and Tom McCarley, HTIS

On June 4, 2008, the U.S. Environmental Protection Agency (EPA) issued a final rule amending the list of hazardous wastes from non-specific sources (called F-wastes) by modifying the scope of the EPA Hazardous Waste No. F019 (Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such

phosphating is an exclusive conversion coating process) that is currently listed at 40CFR261.31. Per the amended rule, wastewater treatment sludges from the zinc phosphating process used in the motor vehicle manufacturing process are no longer subject to the F019 waste listing at the point of generation, provided the wastes are not placed outside on the land prior to shipment to a landfill for disposal in a municipal solid waste or other landfill with a single clay or composite liner.

Generators must maintain in their on-site for a minimum of three years documentation and information sufficient to prove that the conditions of disposal have been met, but the recordkeeping requirement is not a condition of the waste exemption. The recordkeeping requirement in the final rule will include:

- The volume of waste generated and disposed of off site;
- Documentation showing when the waste volumes were generated and sent off site;
- The name and location of the receiving facility; and
- Documentation confirming receipt of the waste by the receiving facility.

The revised listing at 40CFR261.31 will now read: **F019 - -** "Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing", when such phosphating is an exclusive conversion coating process. Wastewater treatment sludges from the manufacturing of motor vehicles using a zinc phosphating process will not be subject to this listing at the point of generation if the wastes are not placed outside on the land prior to shipment to a landfill for disposal and are either: disposed in a Subtitle D municipal or industrial landfill unit that is equipped with a single clay liner and is permitted, licensed or otherwise authorized by the state; or disposed in a landfill unit subject to, or otherwise meeting, the landfill requirements in Sec. 258.40, Sec. 264.301 or Sec. 265.301. For the purposes of this listing, motor vehicle manufacturing is defined in Sec. 261.31(b)(4)(i) of this section and paragraph Sec. 261.31(b)(4)(ii) of this section describes the recordkeeping requirements for motor vehicle manufacturing facilities."

This final action on the F019 listing does not affect any other wastewater treatment sludges either from the chemical conversion coating of aluminum or from other industrial sources. Additionally, this rulemaking also adjusts the F019 listing description under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) list of Hazardous Substances and Reportable Quantities to conform to the amended waste description.

Motor vehicle manufacturing in this case includes automobile and light truck/utility vehicle manufacturing but not heavy truck, motor home, or other vehicle manufacturing. Aluminum is incorporated into the construction of motor vehicles to reduce weight and increase fuel economy. The conversion coating of aluminum parts in the motor vehicle manufacturing industry generates an F019 waste. The conversion coating of steel parts does not generate a listed hazardous

waste. This final rule will reduce compliance costs for automobile manufacturers who use aluminum parts. The EPA believes this rule will encourage the use of aluminum in vehicle construction, resulting in a decrease in vehicle emissions.

In accordance with Agency's Waste Analysis, this rulemaking is based in part on the data gathered during 13 separate delistings granted to the zinc phosphating processes at automobile manufacturing facilities since 1997. Facilities with de-listed wastes may continue to manage their waste under their de-listing agreement, or they may have the delisting withdrawn and manage their waste under the new rules.

This rule became effective July 7, 2008. Because this rule is promulgated under the non-HWSA authority of RCRA 3001(b), it will not come into effect in authorized states until the state adoption process is completed. Authorized states are not required to adopt rules such as this one that are less stringent than current standards.

The final rule published in the Federal Register can be viewed at http://edocket.access.gpo.gov/2008/pdf/E8-12483.pdf. For information on specific aspects of the rule, contact James Michael of the Office of Solid Waste (5304P), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, (E-mail address and telephone number: michael.james@epa.gov, (703) 308-8610).

Reference: 1. Federal Register (FR) volume 73, Pages 31756 - 31769 (73FR31756), Wednesday, June 4**,** 2008.

EPA Approves R-152a as a Motor Vehicle Refrigerant

By Tom McCarley, Chemist, HTIS

On June 12, 2008, the EPA announced that it had approved the motor vehicle air conditioning refrigerant R-152a (HFC-152a) as another possible alternative to stratospheric ozone depleting chlorofluorocarbons (CFCs) that were in use for years. Alternatives to Ozone-Depleting Substances (ODS) are regulated by the EPA under Section 612 of the Clean Air Act under a program known as the Significant New Alternatives Policy (SNAP). Substitute chemicals are regulated for all major ODS applications (refrigeration, solvent use, aerosol use, foam-blowing etc.) and are regulated under the SNAP program whether or not the substitute materials have any ozone depletion potential. The EPA wants to ensure the substitutes are acceptable for use based on their safety, health, and environmental attributes.

R-152a is chemically 1,1-difluoroethane and has no ozone depleting potential. **The EPA is approving it as a substitute for CFC-12 in newly manufactured vehicles only**. Because there are exposure concerns, "EPA, finds R-152a acceptable in new motor vehicle air conditioning systems with the use condition that systems must be designed to avoid occupant exposure to concentrations of R-152a above 3.7% in the passenger cabin free space for more than 15 seconds, even in the event of a leak". The Army's Research, Development and Engineering Command (RDECOM) was a major contributor to the risk assessment for R-152a.

"EPA requires prominent labeling of R-152a MVAC systems with a warning

such as ``CAUTION SYSTEM CONTAINS FLAMMABLE R-152a REFRIGERANT--TO BE SERVICED ONLY BY QUALIFIED PERSONNEL." Consistent with the SAE J639 Standard, this label must be mounted in the engine compartment on a component that is not normally replaced and where it can be easily seen. This label will include refrigerant identification information and indicate the refrigerant is flammable."

Approval of R-152a also helps harmonize US rulemaking with European Union (EU) restrictions. The EU has banned the use of R-134a which was an early substitute for CFC-12 and still widely used in the US. By 2011, new cars in the US and EU may no longer use R-134a.

Reference: Federal Register, Vol. 73, No. 114 pp 33304-33311, June 12, 2008.

New Safety Measures for Soil Fumigant Pesticides

By Muhammad Hanif, Chemist, HTIS

The EPA is requiring important new safety measures for soil fumigant pesticides to increase protections for agricultural workers and bystanders – people who live, work, or otherwise spend time near fields that are fumigated. For the listed soil fumigants, the EPA is entailing a suite of new mitigation measures that will work together to protect human health. These measures are included in risk management Reregistration Eligibility Decisions (REDs) for the following soil fumigants:

- Chloropicrin
- Dazomet
- Metam sodium, and metam potassium (including methyl isothiocyanate or MITC)
- Methyl bromide

Soil fumigants are pesticides which, when injected or incorporated into soil, form a gas to control pests that live in the soil and can disrupt plant growth and crop production. The fumigants are either volatile chemicals that become gases at relatively low temperatures, around 40 degrees Fahrenheit, or they are chemicals that react to produce such a gas (e.g., dazomet and metam sodium converting to MITC). Gas formed by the soil fumigants permeates soil and kills a wide array of soil –borne pests. According to the EPA, soil fumigants are providing an important tool for American Agriculture and used on a wide range of crops, primarily potatoes, tomatoes, strawberries, carrots, and peppers, to control a wide range of pests including nematodes, fungi, bacteria, and weeds.

Due to the broad range of pests controlled, soil fumigants are used as part of the production of a wide variety of crops and provide high benefits for many growers. According to the EPA, "The new restrictions protect workers and bystanders against inadvertent exposure to soil fumigants and are practical to implement." When fumigants dissipate from the soil, workers or bystanders who are exposed to these pesticides may experience eye or respiratory irritation, or more severe and irreversible effects, depending on the fumigant and level of exposure. The following mitigation measures are designed to work together to protect bystanders and workers:

- To help ensure safe fumigation

practices, users must complete written, site-specific fumigant management plans before fumigations begin.

- Buffer zones around treated fields will reduce the chances of immediate harmful effects to bystanders from fumigant concentrations in air. Buffers can be adjusted based on the use of other good management practices that also reduce risks to bystanders.

- Posting requirements will inform bystanders and field workers about the location and timing of fumigations and associated buffer zones so people do not enter these areas.

- To ensure emergency preparedness, registrants must provide first responders with fumigant-specific safety information and training. Fumigant applicators must monitor buffer zone perimeters or provide emergency response information directly to neighbors.

- Fumigant registrants must conduct outreach programs to educate community members about fumigants, buffer zones, how to recognize early signs of fumigant exposure, and how to respond appropriately in case of an incident.

- Fumigant registrants must adopt more stringent worker protection measures, and develop training for fumigation handlers and workers to enhance their knowledge and skills and to promote product stewardship.
- All soil fumigant products will be classified as restricted-use pesticides, to ensure that only specially trained individuals can apply and oversee fumigant operations.

The EPA's decision will also halt the use of methyl bromide on sites where alternatives are available. The newly registered fumigant iodomethane will be reexamined later this year to determine what new mitigation or restrictions are necessary. The soil fumigant 1,3-dichloropropene, which was evaluated previously, may be subject to similar provisions when the soil fumigants are evaluated together again in 2013.

The fumigants REDs, and "RED Fact Sheets" were published on July 9, and July 10, 2008, respectively. The fact sheets are available for download from the EPA's website: http://www.epa.gov/oppsrrd1/reregistration//soil_fumigants/#more. **Although these soil fumigant decisions are final, the EPA is providing 60 days for public comments on implementation of these measures and will refine the measures as needed.** To open public comments, the Notice of Availability of EPA's REDS for the soil fumigant pesticides was published in the Federal Register (FR) on July 16, 2008 (73FR40871).

For general information, you may contact John Leahy at (703) 305-6703. For pesticide-specific information, you may contact Andrea Carone at (703) 308-0122 for Chloropicrin, Cathryn O' Connell at (703) 308-0136 for Dazomet, Dirk Helder at (703) 305-4610 for Metam Sodium/Potassium, and Steven Wiess at (703) 308-8293 for Methyl bromide.

References: 1. Federal Register, Volume 73, pages 40871-40873 (73FR40871), Wednesday, July 16, 2008. 2. News Release: "Soil Fumigant Pesticides Subject to New Safety Measures" by the U.S. Environmental Protection Agency (EPA), Thursday, July 10, 2008. 3. EPA's Pesicides Reregistration webpage "Risk Mitigation Measures to Address Inhalation Exposures from Soil Fumigant Applications" by U.S. EPA (epa.gov/oppsrrd1/reregistration/soil_fumigants/ July 10, 2008.

International Import and Export

Reprint submitted by Ariel Rosa, HTIS

A variety of laws and regulations govern import and export requirements of materials which may pose a risk to human health and the environment. The EPA has developed a one-stop Web portal to help importers and exporters of goods meet requirements to protect human health and the environment. The portal provides information about:

- Vehicles and engines,
- Fuel and fuel additives,
- Ozone depleting substances,
- Chemical substances regulated under the Toxic Substances Control Act,
- Pesticides, including pesticide residues on foods,
- Hazardous wastes,
- Plumbing products, and
- Scrap metal.

The portal is being released in conjunction with the federal government's update to the November 2007 Action Plan for Import Safety. The update summarizes achievements in import safety over the past several months and key steps planned to enhance the safety of imported goods.

Reference: http://www.epa.gov/compliance/international/importexport.html

Green Buildings a Growing Trend

By Abdul H. Khalid, Chemical Engineer, HTIS

Green buildings continue to rise and there is a growing trend to seeking various architectural designs to save energy prices.

Americans are looking to save money on home energy costs due to rise in energy demand. Environmentally friendly green buildings movement is what people are thinking now. People are thinking about the cost of building and the energy and what system should they use to save energy whether to heat or cool the house. Waste products are important how they are produced and where they end up.

In a news release of June 10, 2008, the U.S. Environmental Protection Agency (EPA) announced the growing trend in

"Green Buildings" and highlighted the numerous opportunities to improve the impacts of buildings on the environment and health.

The EPA has acknowledged this growing trend and expanded the agency role in this area. For this purpose, the EPA has released a new video on green buildings in its "Green Scene" series. The video features Dr. Bill Sanders, director of the EPA's National Center for Environmental Research, talking about how the EPA is encouraging and supporting green building, and how homeowners can take simple steps to green their homes. The EPA's new green building strategy is to:

- Facilitate the mainstream adoption of green building practices.
- Calls for better coordination among existing programs, such as Energy Star and WaterSense, which are designed to reduce the impacts of buildings and development.
- An increased focus on research. In fact, the EPA already has invested a significant amount of funding in green building research, including more than 80 grants and fellowships awarded by the National Center for Environmental research.
- The center has also awarded more than $5 million through its Small Business Innovative Research contracts. Understanding the benefits of green building on people is important since Americans spend nearly 90 percent of their time in buildings. Currently, buildings are responsible for nearly 40 percent of U.S. energy use and about 40 percent of U.S. carbon dioxide emissions, the primary greenhouse gas.

There are many ways and opportunities to reduce these impacts in the buildings where we live, work and play. For further information, DOD interested personnel should contact, Suzanne Ackerman, phone: 202-564-4355 or e-mail at: ackerman.suzanne@epa.gov or view the Green Scene at: http://www.epa.gov/multimedia/playercontents/video/greenscene22/greenbuilding.html or the EPA's green building program at: http://www.epa.gov/greenbuilding/index.htm

Reference: EPA's News Release, June 10, 2008 "Green Buildings on the Rise" or visit EPA' Newsroom at: http://www.epa.gov/

2008 EPA Report Showcases Resource Conservation Challenge Accomplishments

By Tom McCarley, Chemist, HTIS

The Resource Conservation Challenge (RCC) is a multi-pronged effort to reduce solid and hazardous waste by enhancement of the nation's ability to recycle and reuse toxic and hazardous chemicals, electronics, and other industrial materials. In a

28 page report entitled "Resource Conservation Challenge Update" and dated March 1, 2008, the EPA outlines some of the RCC accomplishments. The report is available at: http://www.epa.gov/epaoswer/osw/conserve/resources/rcc-rpt3.pdf .

Some of the accomplishments mentioned include:

- Reduction of greenhouse gases (50 million metric tons carbon equivalent) by an increase in the national recycling rate to 32.5% (2006 latest data). This amounts to recycling over 80 million tons of municipal solid waste.

- Finding new life for old carpets and keeping them out of landfills.

- There are more than 7000 PAYIT communities in the US and others around the world that charge consumers for what they throw away. Most consumers pay a flat fee for garbage service or have that service included with the taxes they pay. Pay-as-You-Throw charges based on how much you discard.

- Increased use of curbside recycling programs and the start of "RecycleBank" programs which credit homeowners with "Recycle Dollars" based on the weight of recycled materials. Recycle Dollars can then be redeemed a local and some national merchants.

- Increased recycling of old electronics and purchase of "greener electronics" by federal agencies.

- Recycling programs for old CRT tubes and cell phones

- Increased use of waste materials such as flyash in construction

- Establishment of automotive mercury switch removal programs nationwide. More than 6000 vehicle dismantlers and shredders participate in the program. Many convenience light switches in our cars contain up to 1 gram mercury each.

- Increased recycling of old tires has greatly reduced the landscape of tire piles. In 1994 there were an estimated 800 million scrap tires in US tire piles. The number is now less than 200 million.

References: EPA: "Resource Conservation Challenge Update", EPA 530-R-08-005, March 1, 2008

EPA's Fact Sheet for Auto Refinishers

By Abdul H. Khalid, Chemical Engineer, HTIS

The U. S. Environmental Protection Agency (EPA)'s Office of Pollution Prevention and Toxic's (OPPT) runs the Design for the Environment (DfE) Program. This program forms partnership with industries to reduce the risks to people and the environment through

pollution prevention. Many stakeholders consider DfE Partnerships the forum of choice for pressing issues in chemical sustainability and an important agency tool for implementing "Green Chemistry". This office works with industries and identifies and promotes safer, cleaner, and more efficient practices and technologies. The EPA uses the office's chemical assessment tools and expertise in implementing greening chemistry and sometime finds substitutes for toxic chemicals that are less hazardous or friendlier to our environment. For basic information on The Design for the Environment (DfE) Program, visit the EPA's web site at: http://www.epa.gov/dfe/.

On May 1, 2008, the EPA issued a fact sheet entitled, "Spray Booth Filters: The Key to Quality Jobs and Clean Emissions". This publication # EPA 744-F-08-001 can help auto body refinishers during auto refinishing operations and complying with regulation governing hazardous air pollutant emissions from paint-stripping and coating operations. The fact sheet is available at: http://www.epa.gov/dfe/pubs/auto/factsheet/sprayboothfilters.pdf.

The fact sheet was issued as part of DfE Auto Refinishing Project working with the auto refinish industry to promote practices and technologies that reduce toxic emissions of diisocyanates, organic solvents, heavy metals, and other hazardous air pollutants. It describes how auto refinishers should maintain spray booth filters and reminds workers that the filters do not remove solvent vapors or volatile organic compounds from the air in the shop. Tips for worker safety include urging workers who are replacing used filters to wear specific personal protective equipment.

The EPA issued a final standard on National Emission Standards for Hazardous Air Pollutants (NESHAP) pertaining to paint stripping and miscellaneous surface coating operations at area surfaces in January 2008. Under this final rule all shops that spray coatings containing a hazardous air pollutant must conduct that spraying within a booth that has an exhaust filter capable of removing 98 percent or more of that pollutant.

For details on the requirements for Surface Coating Operations, read the final standard on NESHAP online at: http://edocket.access.gpo.gov/2008/E7-24718.htm.

Reference: 1. Federal Register, January 9, 2008, Vol. 73, No. 6, pages 1737-1768 or visit GPO web site at: http://edocket.access.gpo.gov/2008/E7-24718.htm. 2. Fact Sheet "Spray Booth Filters: The Key to Quality Jobs and Clean Emissions" at: http://www.epa.gov/dfe/pubs/auto/factsheet/sprayboothfilters.pdf.

NIOSH News

Hazards of Waste Anesthetic Gases

By Abdul H. Khalid, Chemical Engineer, HTIS

In September 2007, the U.S. National Institute for Occupational Safety and Health (NIOSH) issued publication No. 2007-151, titled, " Waste Anesthetic Gases: Occupational Hazards in Hospitals". This publication is an alert for healthcare workers who could be exposed to small amounts of waste anesthetic gases from leaks during medical procedures. This publication is available from the NIOSH web site http://www.cdc.gov/niosh/pubs/all_date_desc_nopubnumbers.html.

Anesthetic gases can leak from a patient's anesthetic breathing circuit into the air of operating rooms or during delivery of anesthesia, thereby becoming waste anesthetic gases. Workers in hospitals operating rooms, recovery or delivery rooms, dental offices, and clinics have the potential to be exposed to harmful levels of waste anesthetic gases such as nitrous oxide or the halogenated anesthetics gases halothane, enflurane, sevoflurane, and others with combination of nitrous oxide. Effects of exposure to waste anesthetic gases at high and low concentrations are:

Exposure to high concentrations

Effects of waste anesthetic gases (even for a short time) may cause health effects such as headache, irritability, fatigue, nausea, drowsiness, difficulties with judgment and coordination, and liver and kidney disease.

Exposure to low concentrations

Although some studies report no adverse health effects from long-term exposure to low concentrations of waste anesthetic gases, several studies have linked such exposure to miscarriages, genetic damage, and cancer among operating-room workers. Studies have also reported miscarriages in the spouses of exposed workers and birth defects in their offspring.

Health workers can be exposed in many ways, for example, during initial hook up, checking anesthesia system, patient exhales of anesthetic gases, or during purging. Some of the measures for controlling exposures of waste anesthetic gases are:

- Engineering controls
- Good work practices
- Air monitoring
- Hazard communication and training

For further information on waste anesthetic gases, other occupational safety and health related topics, contact NIOSH at phone: 1–800–CDC–INFO (1–800–232–4636) or e-mail at: cdcinfo@cdc.gov

Reference: 1. NIOSH Publications at: http://www.cdc.gov/niosh/pubs/all_date_desc_nopubnumbers.html 2. OSHA's occupational safety and health topics at: http://www.osha.gov/SLTC/wasteanestheticgases/

Other News

"Green" Alternatives for Plasticizers

By Moraima Lugo-Millán, Chemist, HTIS

Plastic materials are everywhere in our daily lives. From food wrappings and containers to detergent and soft drink bottles, from shower curtains to medical devices, from toys to wire-cable coatings, a variety of products are made or contain certain type of plastic material. Recently, the safety of commonly used plastics has become one of the major concerns around consumers, since the main ingredient used to produce plastic could be linked to health problems. Also plasticizers are known to be a great hazard to the environment affecting the quality of water and air. The environmental impact of persistent plastic wastes is a growing global concern and alternative disposal methods are limited. Those are some of the reasons why researchers are trying to find "green" alternatives for plasticizers and are focusing on the

substitution for di(2-ethylhexyl) phthalate (DEHP), the most widely used phthalate plasticizer. Due to its suitable properties, versatility, and low cost, DEHP is widely used in the production of polyvinyl chloride (PVC) to increase the polymer's flexibility. This plasticizer is not chemically bound to the plastic and can be absorbed from food and water, leaches out into the solutions in contact with the plastic, and finally migrates to the human body causing adverse effects in high concentrations. Also when disposed, the plasticizer can leach out and transform into potentially harmful metabolites affecting the environment.

Industries and universities are doing research in order to develop and provide safer or "greener" plasticizers. For health products, PVC devices that do not contain DEHP are highly recommended, but if not available, the exposure to DEHP should be minimized by reducing exposure time and temperature. Some alternatives for PVC DEHP-free devices for medical procedures are ethylene vinyl acetate, silicone, polyethylene or polyurethane. Some companies are testing new potential natural products that could be used as replacements for most traditional plasticizers. These products are made from vegetable-based raw materials (fully hydrogenated castor oil and acetic acid) offering a long-term safe solution for health and the environment without compromising efficiency and performance. Also the epoxidized linseed oil (ELO) has been studied, because it gives PVC thermal stability and prevents it from degrading when heated. Other scientists are researching and conducting efforts in the design of new plasticizers that mimic DEHP's structure but lack its toxic effects on common soil microorganisms, degrading into CO_2 and water. Their effort is involved in processing and mechanical property testing of plasticizer/resin blends where the plasticizer structure can allow them to degrade into harmless metabolites while still serving as a cost-effective mechanical property enhancer in plastic formulations. Also the use of esterified rapeseed oil as plasticizer in plastic processing has been studied as an alternative for traditional plasticizers. In addition, biodegradable plastics from wheat starch and polylactic acid (PLA) have been extensively studied through the latest years.

Some manufacturers agree that even though many non-phthalate plasticizer alternatives are on the market, none has achieved the high quality and performance of phthalate esters, such as DEHP. It is true that there is a pressing need to develop "green" plasticizers and other materials based on renewable resources that do not involve the use of toxic or noxious components in their manufacture. These polymers should be biodegradable materials derived from naturally available raw materials, such as corn or other agricultural crops, and they should also allow composting to naturally occurring degradation products or recovery and reconstitution into their monomeric form. Scientific efforts are directed toward developing biodegradable and environmentally friendly alternatives to present polymeric materials that may alleviate health and environmental concerns, but at the same time materials highly efficient in their applications.

References:

1.http://www.epa.gov/ttn/atw/hlthef/eth-phth.html

2. http://www.fda.gov/cdrh/safety/dehp.html
3. http://www.ecologycenter.org/iptf/plastic_types/bioplasticsfromwheat.html
4. http://pubs.acs.org/cgi-bin/sample.cgi/esthag/asap/html/es801828p.html

PCBs in Capacitors

By Ariel Rosa, Environmental Protection Specialist, HTIS

Polychlorinated biphenyls (PCBs) range in appearance from colorless, oily liquids to more viscous and increasingly darker liquids, to yellow and black resins depending on the degree of chlorination. At one time they were used in a wide range of "open" applications such as sealants, lubricants and cutting oils and also in "closed" applications such as transformers, capacitors and electrical switching equipment, where PCB-containing oil served as an insulatant and coolant. PCBs were used because they are extremely stable and have excellent insulating and heat transfer properties. More than 1.5 billion pounds of PCBs were manufactured in the United States prior to cessation of production in 1977.

Unfortunately, PCBs were later found to have a number of harmful effects. They were so stable that, once released into the environment, they did not degrade appreciably over time and could persist for decades. Once ingested by organisms, they were found to accumulate in tissues (being fat soluble, they could pass into fatty tissue, but being non-water soluble, they could not readily be excreted again). They would then become more concentrated as material from lower organisms moved up the food chain, ultimately causing harmful health effects in humans. They can now be detected at low levels in all environmental media and animal tissues.

PCB can enter the body three main ways: *absorption* -- by chemical contact with the skin; *ingestion* by consuming contaminated food or drinks or; *inhalation* -- breathing in of the chemical vapors.

At room temperature PCBs are not significantly volatile and, therefore, not much of an inhalation hazard, however, if they are heated the generation of vapors increase and are released into the air along with dioxins. Dioxin and dioxin-like compounds are byproducts of high-temperature industrial and waste treatment and disposal processes, especially the burning of chemicals that contain chlorine. Dioxin and dioxin-like compounds also persist in the environment for decades. They can cause cancer and are toxic to the fetal endocrine system.

Evidence from experiments with animals showed that PCBs can disturb liver metabolism, affect the endocrine, immune and reproductive systems, and cause cancer, with such affects often seen at relatively low doses. In contrast, the only consistent clinical finding seen in humans after severe PCB exposure is chloracne, a disfiguring skin condition. Although there is inadequate human evidence for effects other than chloracne, the pattern of animal evidence and the marked ability of PCBs to accumulate in the body do give rise to concern for human effects following high exposures to PCBs.

On July 2, 1979, federal law banned the production and sale of PCBs in the U.S. However, it remains a potential legacy problem. PCB-containing materials may be present at facilities, and PCB-laden wastes may be generated during renovations.

Federal and state PCB regulations and requirements apply both to PCB waste materials and to PCBs still in use. Items containing a PCB concentration of 50 ppm or greater are regulated for disposal under the Toxic Substances Control Act (TSCA) regulations for PCBs at 40 CFR Part 761.

Capacitors are a main source of PCBs. A capacitor is an electrical component that stores electricity and helps an electric motor to operate more smoothly by minimizing voltage fluctuations. PCB capacitors may have been used in the following electrical and electronic appliances manufactured between the 1950s and the mid-1980s:

- Fluorescent strip lights for industrial and business premises
- Domestic appliances such as washing machines, spin dryers, mangles, cooker hoods, microwave ovens, freezers and dishwashers
- Audio/visual equipment
- Street and garden lights
- Oil burners and warm air appliances
- Vehicle start motors

The manufacture of PCB capacitors was banned in the U.S. in 1978, but stockpiled PCB capacitors continued to stay in service for their remaining useful life. Some appliances manufactured abroad may also have PCB capacitors despite the federal restrictions. Large capacitors containing three pounds of PCBs or more were required to be replaced by 1988.

Appliance makers were given an extension to use up their remaining stock of PCB-containing capacitors. The service life of domestic appliances and equivalent equipment is between 5 and 25 years so, while the majority of appliances are likely to have been replaced by now, there may still be appliances in use which still contain PCB capacitors.

There is very little information available on the names and types of capacitors manufactured with PCBs. They have not been made for many years, and many of the manufacturers are no longer in business, so much information on products containing PCBs is not available.

Some guidance on the identification of small PCB capacitors in the most commonly used equipment is given below, but in many cases you will be unable to tell, therefore, you should judge on basis of age of the equipment.

- All capacitors manufactured through 1979 contain PCBs.
- Capacitors manufactured after 1979 that do not contain PCBs are labeled “NO PCBs”
- If a capacitor is not labeled “NO PCBs”, it is assumed to contain PCBs.

Many manufacturers included PCBs in all capacitors which they produced during this period of time and it would be prudent to assume that any equipment manufactured before 1986 has PCB-containing capacitors unless it is reasonable to assume the contrary. PCB capacitors are most likely to be found in pre-1979 room and central air conditioners, microwave ovens, furnaces, and light ballasts, as well as in some

refrigerators and freezers. A PCB ballast capacitor may contain about one ounce of PCB dielectric fluid.

The major waste stream containing small PCB filled capacitors is old fluorescent strip and street lighting. PCB containing capacitors within fluorescent light fittings are likely to have the following:

- A resonant start;
- A capacitor that is cylindrical or rectangular, encased in an aluminum container with a weld running all round the top edge with two terminals with quick connect tags;
- A date mark from the 1950s, 1960s, 1970s;
- A capacitor encased in a rectangular metal container with soldered seams;
- Slightly heavier than similar types of capacitors manufactured after the 1970s (which do not contain PCBs)

Fluorescent light capacitors are located in the housing of the light fixtures. You may have to unscrew the back panel to access them.

White goods and other domestic appliances such as washing machines, cookers and radios are most likely to contain starting capacitors, which are used to assist a single-phase electric motor in starting. These components are used for short periods of time during operation of the motor. Consequently, starting capacitors do not need to dissipate heat and are, therefore, primarily dry capacitors.

Starting capacitors are most easily identified by black plastic casing or outer shell.
If the capacitor is dry, the casing is not hermetically sealed or totally enclosed, but generally contains a porous plug at one end. Dry capacitors do not contain PCB and will not need separate collection. A starting capacitor is attached to the housing of the motor and may be covered by a protective casing. This cover must be removed to access the capacitor.

Vehicles manufactured before 1986 would have had limited electrical circuitry and are therefore likely to have contained just one capacitor as part of the starter motor.

The small capacitor exemption from the existing disposal requirements for PCB wastes does not apply under two circumstances. Under existing regulations, if a PCB Small Capacitor is leaking, it is regulated for disposal as a PCB Article and must be disposed of as a PCB waste. If the "potting material" (the insulating material inside the ballast) contains PCBs at concentrations greater than or equal to 50 ppm, then the PCB ballast is a PCB Article and the entire PCB ballast is regulated for disposal as PCB waste, even if the internal small capacitor remains intact and non-leaking.

Regulations require the use of DOT-approved 55-gallon drums for disposal of PCB capacitors once they are removed. Drums should contain absorbent material at the bottom in case some of the capacitors are damaged or leaking. There should be a PCB label placed on each drum that contains PCB capacitors. Drums should be sealed and stored in a secure area that would minimize inadvertent damage or vandalism. It is recommended to have two such drums, one containing intact

capacitors and one to contain any capacitors found to be leaking. This is beneficial because leaking capacitors must be disposed within 30 days, however, intact capacitors can be stored until the drum is full.

A transporter permitted to haul PCB waste should be contacted for disposal of drums filled with capacitors. Records should be maintained including the date of pick-up, the number of drums, names of transporters and destination of the PCB waste for disposal.

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NASA, NOAA and NSF collaborate in Ocean Voyage to Probe Climate-Relevant Gases

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Climate change is one of the most critical global challenges of our time. Recent events have emphatically demonstrated our growing vulnerability to climate change. Climate change impacts will range from affecting agriculture, further endangering food security, sea-level rise and the accelerated erosion of coastal zones, increasing intensity of natural disasters, global warming, species extinction and the spread of vector-borne diseases. Human activities are definitively changing the composition of the Earth's atmosphere. The major greenhouse gases emitted by human activities remain in the atmosphere for long periods of time ranging from decades to centuries threatening the stability of our environment. It is certain that atmospheric concentrations of gases affecting the environment will continue to rise over the next few decades. This is the reason why researchers from the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA) and the National Science Foundation (NSF) have a mission dedicated to studying how gases important to climate change move between the atmosphere and the ocean under high winds and seas.

The mission called Southern Ocean Gas Exchange Experiment is organized by those federal agencies in collaboration and participation with researchers of various universities. The mission consists of a six week expedition throughout the Southern Atlantic Ocean, aboard the NOAA ship Ronald H. Brown, the largest research vessel in the NOAA fleet. Researchers will be studying the rate and mechanisms by which the ocean is taking up carbon and releasing it into the environment and quantifying other gases exchange in that area. The Southern Atlantic Ocean was selected for this study, because it covers a vast area and has some of the roughest seas on Earth, providing a pathway into the deep sea for carbon dioxide (CO_2) released from human activities.

Scientists from various universities and research institutions plan to

measure turbulence, waves, bubbles, temperature and ocean color, to investigate how these factors relate to the air-sea exchange of carbon dioxide and other climate-relevant gases. The objectives of these studies are to:

- Determine the gas transfer velocities at high winds,
- Determine the effect of fetch on the gas transfer,
- Identify how biological processes influence the gas exchange, and
- Determine the effect of other biochemical and physical parameters.

The research will help improve the accuracy of climate models and predictions of atmospheric CO_2 levels and ocean acidification in future climate changes. It will also allow extrapolating the findings into new projects investigating turbulent fluxes of heat, momentum, water vapor, and other gases in the marine boundary layer.

References: 1. http://www.noaanews.noaa.gov/stories2008/20080221_gases.html
2. http://www.nasa.gov/home/hqnews/2008/feb/HQ_08063_NASA_Southern_Ocean_Cruise.html

Transition to CFC-free Metered Dose Inhalers Moves Forward

Reprint submitted by Ariel Rosa, HTIS

For the 2008 calendar year, the Environmental Protection Agency (EPA) has allocated 27.0 metric tons of CFC-114 for the manufacture of epinephrine metered dose inhalers (inhalers). In accordance with the Montreal Protocol on Substances that Deplete the Ozone Layer and the Clean Air Act, the EPA phased out chlorofluorocarbons (CFCs) in 1996, with limited exemptions. One of those exemptions is the production and import of CFCs for use in essential use inhalers to treat asthma and chronic obstructive pulmonary disease.

Each year, in coordination with the U.S. Food and Drug Administration (FDA), the EPA allocates essential use allowances to pharmaceutical companies to manufacture essential use inhalers that use CFCs as a propellant. Essential use allowances permit the production and importation of CFCs after the 1996 phase-out, solely for manufacturing essential use inhalers. The FDA's determination is based on the amount of CFC inhalers necessary to protect public health.

The transition to CFC-free inhalers is well underway and is part of a larger transition that has affected many other consumer and industrial products and sectors over the last several decades. Since 1996, the EPA has significantly reduced the amount of CFCs allocated to pharmaceutical companies to manufacture essential use inhalers. In 1998, the EPA allocated 4,365 metric tons, and in 2007, allocated 167.0 metric tons.

An important factor in the transition to CFC-free inhalers, although separate from today's CFC allocation rule, is an upcoming prohibition on the sale and distribution of CFC-propelled inhalers containing albuterol. **After Dec. 31, 2008**, the EPA regulations will prohibit the sale and distribution of CFC-albuterol metered dose inhalers. There are now four albuterol inhalers available propelled by ozone-safe hydrofluoroalkanes

On May 30, 2008, to foster coordination and education between patients and health-care providers, the FDA issued a public health advisory to alert patients, caregivers, and health care professionals that CFC-propelled albuterol inhalers will not be available after **Dec 31, 2008**. Information on the transition for albuterol inhalers is available at the FDA's Web site at: http://www.fda.gov/cder/mdi/albuterol.htm

Information on the 2008 essential use allocation is available at: http://epa.gov/ozone/title6/exemptions/inhalers.html or you may contact Cathy Milbourn, (202) 564-4355 / milbourn.cathy@epa.gov

Reference: http://epa.gov/ozone/title6/exemptions/inhalers.html

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