Introduction to NIH Hazard Communication Program

The National Institutes of Health's comprehensive Occupational Safety and Health Program has been established to provide NIH employees with places and conditions of employment in which the risk of exposures to potential hazards is minimized.

The NIH Hazard Communication Program (NIH-HCP) described in this booklet is an integral part of the NIH Occupational Safety and Health Program. The NIH-HCP uses a comprehensive approach to inform employees of the potential chemical hazards to which they may be exposed. Additionally, it provides individuals with information concerning protective measures that can be used to minimize these hazards. By having such information available to each employee at the worksite, users of chemicals will be able to recognize potential health hazards and to use the recommended protective measures, thus minimizing the risk of occupational exposures to hazardous chemicals. The ultimate goal of these efforts is to reduce, to the lowest practical level, the incidence of chemically related injuries and illnesses of NIH employees. The NIH-HCP complies with the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR 1910.1200.

The NIH-HCP has been established to provide information about chemical hazards. This information is communicated in three primary ways:

1. Material safety data sheets (MSDSs),
2. Warning labels and signs, and
3. Training programs.

Part I of this booklet describes the responsibilities that NIH management, supervisors, and employees have in developing, implementing, and maintaining the NIH-HCP. Part I also describes how each of the above three mechanisms is used to inform employees of both the hazardous properties of the chemicals they work with and the measures they can take to protect themselves from exposure to these chemicals.

Part II of this booklet includes a summary of the NIH-HCP along with a checklist on how to implement the program.

PART I. THE NIH HAZARD COMMUNICATION PROGRAM (NIH-HCP)

Policy Statement

It is the policy of NIH that all employees who are potentially exposed to hazardous chemicals in their assigned jobs shall be fully informed of both the hazardous properties of the chemicals and the protective measures that are available to minimize exposures to these chemicals. This type of information will be made available to employees by means of labels on chemical containers, material safety data sheets and training. Employees will be informed of any known hazards associated with chemicals to which they may be potentially exposed before their initial assignment and whenever the hazards change. The goal of the NIH-HCP is to reduce employee exposure to hazardous chemicals and thus reduce the overall incidence of chemically-related injuries and illnesses.

Responsibility for Program Implementation

Effective hazard communication can be realized when responsible management and responsive employees work together in developing and implementing an integrated hazard communication program. The NIH-HCP is performance-based, allowing for flexibility in implementing the program components depending on the needs of the employees within the various work environments. The roles and responsibilities of NIH management and employees are outlined below.

Responsibilities of the Director, NIH

The Director, NIH, is ultimately responsible for the health and safety of all NIH employees. The Director establishes health and safety policies and delegates the responsibility for design and implementation of safety and health programs. The Director is responsible for assuring that an effective Hazard Communication Program is administered for all NIH employees.

Responsibilities of the Non-Laboratory Supervisor

Supervisors in support (e.g., housekeeping, animal care, engineering services, etc.) and administrative areas provide the necessary direction and support to ensure the effective implementation of the NIH-HCP for their work locations. The supervisor is responsible for providing the information and training specific to the employees' specific needs and work environment.

The supervisor(s) of each section or work location is responsible for:

1. Identifying chemicals that pose a potential health or physical risk to employees in their work area;
2. Ensuring that employees are made aware of the potential hazards associated with those chemicals, including the availability of chemical specific information (e.g., MSDSs);
3. Maintaining a listing of hazardous chemicals in the workplace;
4. Ensuring that employees minimize any potential exposure through the use of safe work practices, necessary or assigned protective equipment, and the use

of available engineering or facility design features (e.g., specialized ventilation devices such as hoods, physical barriers, etc.);
5. Providing employees, under their supervision, guidance and training specific to their work;
6. Coordinating employee medical consultation and/or surveillance if overexposure to a hazardous chemical is suspected; and
7. Reporting to the NIH Division of Occupational Health & Safety or the NIH Occupational Safety and Health Committee problems pertaining to the implementation of the NIH-HCP.

Responsibilities of the Laboratory Supervisor

Because the use of potentially hazardous chemicals in laboratories is governed by the NIH Chemical Hygiene Plan (NIH-CHP), the laboratory supervisor is exempt from some of the provisions of the Hazard Communication Program. Laboratory supervisors do not have to inventory or keep a listing of all hazardous chemicals used in the laboratory, nor do they have to have a written hazard communication program specific for the laboratory worksite. The laboratory supervisor is responsible for:

1. Ensuring that employees minimize any potential exposure by using appropriate work practices, as specified in the NIH-CHP;
2. Ensuring that employees are aware of the potential hazards associated with those chemicals used in their work area, and have access to chemical specific safety information (e.g., labels, MSDSs);
3. Ensuring that the labels on incoming chemical containers are not removed or defaced;
4. Providing employees, under their supervision, guidance and training specific to their work environment and encouraging employees to attend basic laboratory safety training available through the Division of Occupational Health & Safety;
5. Coordinating employee medical consultation and/or surveillance if overexposure to a hazardous chemical is suspected; and
6. Reporting to the NIH Division of Occupational Health & Safety or the NIH Occupational Safety and Health Committee problems pertaining to the implementation of the NIH-HCP.

Copies of the OSHA Laboratory Standard and the NIH Chemical Hygiene Plan (NIH-CHP) are available from the IC Safety and Health Specialist (301-496-2346).

Responsibilities of the Employee

Employees have the opportunity to affect their work environment by gaining knowledge about the chemical hazards associated with their work and applying this knowledge to reduce the risk of injury and adverse health effects to themselves, coworkers, and visitors in their work area.

Each employee is responsible for:

1. Performing his/her work in a safe manner;

2. Complying with all applicable provisions of the NIH-HCP;
3. Following all standard operating procedures or research protocols for their worksite; and
4. Reporting the existence of health and safety hazards associated with the use of chemicals to his/her supervisor, the NIH Division of Occupational Health & Safety, or the NIH Occupational Safety and Health Committee.

Responsibilities of the Division of Occupational Health & Safety (DOHS)

The Division of Occupational Health & Safety provides administrative management for the NIH-HCP. The DOHS is responsible for:

1. Monitoring federal regulations and updating the NIH-HCP to reflect any changes;
2. Providing basic training in hazard communication for NIH employees;
3. Providing technical guidance and policy interpretation to personnel at all levels of responsibility on matters pertaining to the NIH-HCP; and
4. Providing assistance to supervisors and employees in the implementation of the NIH-HCP. The DOHS employs specialists in industrial hygiene, chemical hygiene, and occupational health and safety to assist all NIH employees in developing effective safety programs for implementation at their worksite. An Occupational Safety and Health Specialist is assigned to each IC to provide support and assistance in addressing the safety and health concerns of NIH employees.

Responsibilities of the NIH Occupational Safety and Health Committee

The NIH Occupational Safety and Health Committee serves in an advisory role to the Director, NIH, and to the directors of the institutes and centers (ICs), and to the DOHS. As it relates to the NIH-HCP, the committee is responsible for:

1. Periodically reviewing and monitoring the status of compliance with the NIH-HCP to evaluate program development, implementation and resources, and
2. Making recommendations for program improvement.

The NIH-HCP Components

The NIH Hazard Communication Program consists of three components:

1. The identification of hazardous chemicals;
2. The maintenance of current hazard information at the worksite including warning labels and signs and material safety data sheets; and
3. The training of employees. The purpose of each of these components, as well as the requirements for implementing them, are provided below.

Identification of Hazardous Chemicals

The NIH-HCP applies to all persons who are potentially exposed to hazardous chemicals in their work. The first step that each non-laboratory supervisor must

take in their work areas is to identify and inventory the hazardous chemicals present.
All supervisors must determine which chemicals may present a hazard to their employees based on the physical and chemical properties of the substance, its potential health effects and how it is used. The identification and inventory of hazardous chemicals should also consider which employees are at risk of exposure. The hazardous chemical inventory and assessment provides the basis for determining what additional controls, safe work practices and training will be needed.

In identifying hazardous chemicals in the work area, attention should be given to:

1. The quantity of the chemical used;
2. The physical properties of the chemical (e.g., volatility, flammability, etc.);
3. The potency and toxicity of the chemical;
4. The manner in which the chemical will be used; and
5. The means available to control release of or exposure to the chemical. It is important that written operating procedures or research protocols for each work area are periodically reviewed to ensure that appropriate safety precautions are included. Protocols should be updated to reflect changes that may affect the chemical hazard assessment of ongoing work.

The chemical listing serves as an index for MSDSs that must be readily available at the worksite, and helps determine how containers must be labeled as well as which employees are in need of training. A complete and current hazardous chemical listing benefits employees who need to select appropriate safeguards to reduce their risk of exposure on a daily basis, as well as those who respond to emergencies or who need to repair equipment that is potentially contaminated with a chemical.

Material safety data sheets should be consulted for important physical and health hazard data. Supervisors may contact the Safety and Health Specialist assigned to their IC (301-496-2346) for assistance in performing a hazardous chemical assessment or to obtain copies of the OSHA Hazard Communication Standard or additional copies of this document.

Hazard Information at the Worksite

Employees must be provided with information about the potential hazards of chemicals before beginning their initial assignment, in order that the potential for harmful exposures is minimized. This hazard information must be made available to employees at the worksite. Two readily available resources for this type of information are the label on the chemical container (see exhibit 1) and the MSDS available from the manufacturer, distributor or importer of the chemical (see exhibit 2).

Labels

Labels on containers of hazardous chemicals serve as an *immediate* warning of the hazards associated with the chemical and as a reminder that more detailed safety and health information is available elsewhere, particularly in an MSDS. For these

reasons, manufacturers, distributors, and importers are required to provide labels that include both the chemical name and all appropriate hazard warnings.

Labels, signs, placards, and other forms of warnings provide *visual* reminders of specific hazards not only to employees working directly with the chemical, but also to others such as visitors, service representatives, housekeeping personnel, and emergency personnel who may encounter these chemicals.

Supervisors must establish procedures to assure that containers of hazardous chemicals are labeled, tagged or marked with:

1. The identity of the hazardous chemical and
2. The appropriate hazard warnings signifying the primary health and physical hazards of the contents.

The chemical identity on the label must correspond to that used in the MSDS. The supervisor must ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container or readily available in the work area. Users of hazardous chemicals should ensure that labels on purchased or supplied chemicals are not removed or defaced unless the container is relabeled with the required information.

Material Safety Data Sheets

MSDSs identify the physical and chemical properties of hazardous chemicals (e.g., flash point, vapor pressure), their physical and health hazards (e.g., potential for fire, explosion, signs and symptoms of exposure), and precautions for safe handling and use. Information in the MSDS covering the physical and chemical properties of a chemical (e.g., volatility, flammability, reactivity), its toxic properties (e.g., carcinogen or reproductive hazard), and routes of exposure can be used to define what potential hazards the material presents to users.

Employees must have access to the MSDS (or the safety-related information contained therein) for each chemical that the supervisor has identified as potentially hazardous within their worksite.

All manufacturers, distributors, and/or suppliers of hazardous chemicals are required to provide an MSDS with each chemical purchased. If shipments of chemicals are received without an MSDS, the recipient should contact the manufacturer/supplier for a copy. If a potentially hazardous chemical is purchased through the Central Store, a copy of the MSDS for that chemical may be obtained from the IC Safety and Health Specialist.

It is important to ensure that MSDSs (or information contained therein) maintained at the worksite provide up-to-date, complete, and accurate information. Supervisors and employees may wish to consult with the DOHS or the National Library of Medicine for access to additional chemical information databases (see appendix B).

Employee Information and Training

All employees working with, or who may be potentially exposed to, hazardous chemicals should receive information and training that will enable them to work safely with those chemicals. Employees should receive training about the nature of the known hazards associated with the chemicals they handle, as well as the measures that are available to protect themselves. By receiving training in a timely manner, employees are better able to make use of the information contained in an MSDS and on labels, to recognize potential hazards to their own health, as well as those for fellow employees or visitors in their work area, and to make informed judgments regarding the appropriate safeguards to use in minimizing their exposures to hazardous chemicals.

Employee training should focus on the following:

1. The known physical and health hazards associated with the chemicals in their workplace;
2. Methods that can be used to detect the presence or release of the chemicals; and
3. Available protective measures to minimize exposures including engineering controls, safe work practices, personal protective equipment, and emergency procedures.

Supervisors must provide this information before employees begin their initial assignment and whenever a new hazardous chemical is introduced into the workplace. This information must be provided for both routine and non-routine tasks.

In addition to job-site specific training provided by the supervisor, the DOHS offers a variety of safety training, industrial hygiene and surveillance programs, and information resources to promote employee health and safety. Information regarding the training opportunities offered by the DOHS can be obtained by contacting the IC Safety and Health Specialist (301-496-2346).

PART II. GUIDANCE IN IMPLEMENTING THE NIH-HCP

A summary of the key requirements for implementing the NIH-HCP is provided in checklist form. More detailed information on each of these requirements is provided on the pages referenced in parentheses. Additional guidance for implementing the program requirements can be obtained by consulting the answers to the questions found on pages 8-10. Supervisors are encouraged to collaborate with the DOHS staff to implement the plan at their specific worksites.

Checklist for Implementing the NIH-HCP

- Identification of Hazardous Chemicals by Work Area
- Obtain and Maintain MSDSs of Hazardous Chemicals from Manufacturers/Distributors
- Devise Method to Ensure that MSDSs (or information contained therein) are Accessible to Employees
- Ensure Labels are Legible and List Chemical Name and Necessary Hazard Warning Information
- Inform Employees of NIH-HCP
- Inform Employees of Job-site Specific Chemical Hazards and Available Protective Measures for Reducing Potential Exposure
- Provide New Information on Chemical Hazards as It Becomes Available

Answers to Questions on Program Implementation

1. What is a hazardous chemical?

OSHA's Hazard Communication Standard (29 CFR 1910.1200) broadly defines a hazardous chemical as any chemical whose presence or use is a physical hazard or a health hazard.' Chemicals defined as "physical hazards include:

- combustible liquids, compressed gases, explosives, flammables. organic peroxides, oxidizers, pyrophorics, and unstable or water-reactive chemicals.

Chemicals defined as "health hazards" include those that:

- cause either acute or chronic health effects due to exposure by inhalation, ingestion or direct skin or eye contact. The term health hazard includes chemicals which are carcinogens, reproductive toxins, irritants, corrosives, sensitizers, and chemicals that damage a specific organ or system (e.g., hepatotoxins, nephrotoxins).

Supervisors and employees may wish to consult the OSHA Hazard Communication Standard for more detailed definitions of both physical and health hazards. Additional information can be obtained by attending DOHS training programs or calling the Safety and Health Specialist assigned to your IC at (301) 496-2346.

The NIH-HCP uses OSHA's broad definitions to refer to the hazardous properties which may be associated with chemicals. However, to determine whether certain chemicals pose physical or health risks to employees and require inclusion in the NIH-HCP, specific attention should be given to the exposure potential of chemicals present in the work area. Exposure potential is dependent on the following:

1. The quantity of the chemical used;
2. The manner in which the chemical is used; and
3. The means available to control release of or exposure to the chemical.

Additional factors that may influence the effects of chemicals on the health of employees are the potency or toxicity of the chemical and any characteristics of the persons using the chemical that may place them at increased risk (e.g., medical conditions, sensitivity to the chemical).

2. How can I get a copy of OSHA's Hazard Communication Standard?

A copy of the standard is available by contacting your IC Safety and Health Specialist at (301) 496-2346.

3. What sources of information are available for compiling a list of hazardous chemicals?

As an aid in determining substances which are considered to be hazardous, supervisors should consult OSHA's Hazard Communication Standard for detailed explanations and definitions of categories of hazardous chemicals. Manufacturer's MSDSs can be used to identify important physical and health hazard data. Information on developing and maintaining chemical listings and performing chemical hazard assessments can be obtained by contacting the IC Safety and Health Specialists in the DOHS.

4. Why can't I simply rely on the manufacturer's/ supplier's MSDS to determine whether a chemical is hazardous?

While the chemical and physical properties of the material (e.g., its volatility, flammability, reactivity), as well as its toxic properties (e.g., carcinogen or reproductive hazard), can be used to define the hazard potential the material presents to employees, the risk of experiencing harmful health effects varies with the degree of exposure in a given work operation. Therefore, the determination of what constitutes a hazardous chemical needs to be made by the supervisor for his/her work area. Factors influencing the degree of exposure include the quantity of chemical, the manner in which it is used, and the means available to control the release of, or exposure to the chemicals.

5. What information must be maintained and made accessible to employees at the worksite?

A current list of chemicals identified as potentially hazardous to employees, MSDSs (or information contained within) for those chemicals, and labels that identify the chemical and list the critical hazard information must be maintained and made

accessible at the worksite. In certain cases, the information in the MSDS section covering precautions and safe handling and use may apply more to chemical usage in *industrial processes.* Therefore, NIH users of chemicals should factor in their own working requirements and conditions of use when selecting appropriate work practices, personal protective equipment, and engineering controls.

Laboratories do not have to maintain chemical listings under the hazard communication standard.

6. What if I find that the manufacturer's/supplier's MSDS provides incomplete information or is missing critical information?

Two additional sources of information are available. The National Library of Medicine (NLM) has several databases that can be used to access additional information (see appendix B). The DOHS also maintains an MSDS database for a large number of chemicals. If you need information, contact your IC Safety and Health Specialist at (301) 496-2346.

7. What if the manufacturer's/supplier's MSDS does not include the names or identity of the chemical component(s)?

Information relating to the chemical identity or name of a hazardous chemical may be withheld by the chemical manufacturer, importer or employer if it is deemed a trade secret. However, information about its harmful properties can not be withheld and must be included in the MSDS. Also, the chemical identity must be made available to health professionals and certain designated individuals to render medical treatment, to bring about protective measures in an emergency or, when requested in non-emergency situations, to protect employees who may be potentially exposed.

For such disclosures, a written statement of confidentiality may be required prior to release of the chemical identity or, in an emergency situation, as soon as circumstances permit.

8. If an employee works with several hazardous chemicals in a process, is it necessary to maintain an MSDS for each hazardous chemical present?

Employees must have access to information related to potentially hazardous chemicals identified in each work area. This information may be the manufacturer's MSDS or some other source that contains pertinent health and safety information. The supervisor, however, may choose to develop safe operating procedures for processes that cover groups of hazardous chemicals designed to identify and control the collective hazards associated with these chemicals. In these cases, individual MSDSs do not have to be maintained.

9. Do I have to re-label all incoming containers of hazardous chemicals?

Manufacturers and suppliers of hazardous chemicals are required to label their containers with the identity of the chemical and the appropriate hazard warnings. Therefore, in most cases, incoming containers will not have to be relabeled, if the majority of employees in a work area speak a language other than English, supervisors may add the necessary information in that language as long as the information is presented in English as well.

10. Do I need to label processing equipment?

For stationary process containers (including automated processing equipment such as auto-analyzers or DNA synthesizers, signs, placards, or other written operating procedures may be used in place of labels as long as it is clear to which containers these instructions refer.

11. Do I need to label transfer containers?

When transferring hazardous chemicals from a labeled container to another the portable or transfer container does not have to be labeled if only one person handles the container and the container is filled and emptied by that person during the workday. In situations where other persons may be exposed to the chemicals present in the portable or transfer container, it is always prudent to label the container to inform those who are potentially exposed about the hazards associated with the chemical and the necessary precautions to minimize their exposure.

12. Does laboratory glassware need to be labeled?

Laboratory containers such as beakers, test tubes, etc., do not have to be labeled with hazard information since they are usually intended for immediate use. However, it is good laboratory practice to identify the contents of all containers.

13. In addition to labels, what other forms of warning should be used to identify the presence of hazardous chemicals?

In some cases, warning signs on doors should be used to alert persons not to enter the work area unless they are aware of the necessary safeguards. Door signs should also provide the name and telephone number of the person(s) to contact in case of emergency. This information is especially important for visitors or employees not assigned to that area.

14. If MSDSs and labels are maintained at the worksite, why is it necessary to train employees?

MSDSs and labels have limited value unless the employees understand how to use the information and are aware of actions to be taken to avoid or minimize hazardous exposures and thus the occurrence of adverse health effects Training provides this opportunity and allows supervisors to assess their employees' level of understanding of the material and their use of written operating procedures or protocols.

15. What additional training programs covering chemical safety are available?

The DOHS offers a program entitled Laboratory Safety at the National Institutes of Health." Contact your IC Safety and Health Specialist for a course announcement. Additional training in Hazard Communication for supervisors, support, and administrative personnel is provided by the DOHS on an as needed basis. An introduction to the general topic of hazard communication is included in the NIH Training Center Course entitled "Introduction to Supervision."

16. What if I believe that I have not been provided with the required hazard information?

All NIH employees have the right to discuss their safety and health concerns with their supervisor, the DOHS, and the Occupational Safety and Health Committee without fear of reprisal for expressing their concerns.

17. Are contract employees covered under the NIH-HCP?

Employees working under contract at the NIH are subject to their employer's Hazard Communication Program to the extent that hazardous chemicals are being supplied and used by the contractor. Contract employees potentially exposed to chemicals present at the NIH facility can obtain NIH-HCP information from the NIH project officer for the contract. NIH contractors must submit a listing of hazardous chemicals they bring into NIH facilities and provide corresponding MSDSs to the NIH project officer for the contract.

18. Who can I contact if I have questions on implementing any of the requirements of the NIH-HCP?

A toxicologist within the DOHS provides technical guidance on matters pertaining specifically to the NIH-HCP. In addition, the DOHS has assigned Safety and Health Specialists to each IC to assist NIH employees with safety and health concerns. Contact your IC Safety and Health Specialist at (301) 496-2346 to obtain the necessary assistance.

APPENDIX A -General References

American Conference of Governmental Industrial Hygienists (Issued annually). *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.* 2005. Cincinnati, Ohio.

Bretherick, L. *Handbook of Reactive Chemical Hazards.* 3rd ed. 1985. Butterworths, Boston.

Bretherick, L. *Hazards in the Chemical Laboratory.* 4th ed. 1986. Royal Society of Chemistry, London.

The Merck Index. An Encyclopedia of Chemicals and Drugs. 11th ed. 1989. Merck and Company, Inc., Rahway, New Jersey.

National Institutes of Health (NIH). *NIH Occupational Safety and Health Management.* 2/27/2006. NIH Manual Issuance No. 1340.

National Institutes of Health (NIH). *NIH Guidelines for the Laboratory Use of Chemical Carcinogens.* 1981. NIH Pub. No.81-2385.

National Research Council. *Prudent Practices for Handling Hazardous Chemicals in Laboratories.* 1981. National Academy Press, Washington, D.C.

NIOSH Pocket Guide to Chemical Hazards. June, 1997 (or subsequent editions). National Institutes for Occupational Safety and Health (NIOSH), Cincinnati, Ohio, Government Printing Office (GPO), Washington, D.C., GPO Stock No. 017-033-00483-8.

Patty's Industrial Hygiene and Toxicology. Vol. 1 - General Principles, Vol. II – Toxicology, Vo I . III - Theory and Rationale of Industrial Hygiene Practice. 4th ed. 1991. Wiley-Interscience, New York.

Sax, N. I. *Dangerous Properties of Industrial Materials.* 7th ed. 1989. Van Nostrand Reinhold Company, New York.

Steere, N.V., (Fd.) *CRC Handbook of Laboratory Safety.* 3rd ed. 1990. CRC Press, Boca Raton, Florida.

U.S. Department of Labor. *Chemical Hazard Communication.* 1992. Occupational Safety and Health Administration (OSHA), Washington, D.C., OSHA Publication No. 3084.

U.S. Department of Labor. *Hazard Communication Guidelines for Compliance.* 1988. Occupational Safety and Health Administration (OSHA), Washington, D.C., OSHA Publication No. 3111. U.S. Government Printing Office (GPO), Washington, D.C., GPO Stock No. 929022-00000-9.

U.S. Department of Labor. Title 29 Code of Federal Regulations (CFR) Parts 1910, 1915, 1917, 1918, 1926, and 1928 - *Hazard Communication. 1989. U.S. Government* Printing Office, Washington, D.C.

U.S. Department of Labor. Title 29 Code of Federal Regulations (CFR) Part 1960 - *Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters.* 1991. U ,S. Government Printing Office (GPO), Washington, D.C.. GPO Stock No. 869-013-00113-3.

World Health Organization (WHO). *Handling Chemical Carcinogens in the Laboratory - Problems of Safety.* 1979. International Agency for Research on Cancer (IARC) Lyon, France. IARC Scientific Publication
No. 33. WHO Publication Centre, 49 Sheridan Avenue, Albany, NY 12210.

APPENDIX B - National Library of Medicine (NLM) Databases for Chemical Hazard Information

The NLM collection of databases can be directly accessed through the "Grateful Med" software package. For more information about the databases listed below, as well as to receive an application package for "Grateful Med." Contact (301) 496-6193 and ask for the service desk.

1. Registry of Toxic Effects of Chemical Substances (RTECS)

RTFCS is a database file containing toxic effect data on 90,000 chemicals. Both acute and chronic effects are covered including data on contact irritation, carcinogenicity, mutagenicity, and potential reproductive hazards. Federal regulatory requirements and exposure levels also are included.

2. Toxicology Information Online (Toxline) and Toxicology Literature from Special Sources (Toxlit)

Toxline and Toxlit are the NLM's online, interactive collection of toxicological information containing references to published material and research in progress.

3. Toxicology Data Network (Toxnet)

Toxnet is a computerized system of toxicologically oriented factual data banks managed by the National Library of Medicine. Many NIH facilities with NLM accounts may access this database directly, those facilities which do not have access to the NLM can request assistance from the NLM.

4. Medlars Online (Medline)

The Medline is the NLM file of bibliographic citations from approximately 3,400 medical and biomedical journals.

APPENDIX C - NIH-HCP Resources

Use this space for your personal record of resources
that are available in implementing the NIH-HCP.

APPENDIX D - Glossary of Terms

Acute Effect:
An adverse effect on a human or animal which has severe symptoms developing rapidly and coming quickly to a crisis.

Carcinogen:
A substance or agent capable of causing or producing cancer in mammals, including humans. A chemical is considered to be a carcinogen if it is listed by either the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or by the Occupational Safety and Health Administration (OSHA).

Chronic Effect:
An adverse effect on a human or animal body, with symptoms which develop slowly over a long period of time or which recur frequently.
Combustible Liquid. Any liquid having a flashpoint at or above 100° F (38° C), but below 200° F (93° C).

Corrosive:
A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact.

Engineering Control:
A mechanical or design feature intended to remove or isolate potentially harmful substances in the work place. Common engineering controls include local exhaust ventilation systems such as hoods and physical barriers to contain potential hazards.

Explosive:
A chemical that causes a sudden, almost instantaneous release of pressure, gas and heat when subjected to sudden shock, pressure, or high temperature.

Flammable:
A solid, gas, liquid or aerosol that will ignite and burn according to specific tests and definitions. A flammable liquid is defined as any liquid having a flashpoint below 100° F (38° C).

Flashpoint:
The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite and burn according to specific tests and definitions.

Hepatotoxin:
A substance that causes injury to the liver.

Irritant:
A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.

Nephrotoxin:
A substance that causes injury to the kidneys.

Non-Routine Task:
A specific task or activity that is not part of the employee's assigned duties. A non--routine task includes work which the employee may not have specific training or requisite experience
to do the work safely.

Organic Peroxide:
An organic compound that contains the bivalent -0-0 structure and may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

Oxidizer:
A chemical other than a blasting agent or explosive that initiates or promotes combustion in other materials, causing fire either by itself or through the release of oxygen or other gases.

Personal Protective Equipment:
Devices worn by the worker to protect against potential hazards. Typical examples include chemically resistant gloves, eye and face protection, hard hats, impermeable aprons, etc.

Pyrophoric:
A chemical that will ignite spontaneously in air at a temperature of 130° F (54.4) C) or below.

Reproductive Toxin:
Substances that affect either male or female reproductive systems and may impair the ability to have children.

Sensitizer:
A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

Target Organ Toxin:
A toxic substance that attacks a specific organ of the body

Vapor Pressure:
The pressure exerted by a saturated vapor above its own liquid in a closed container. These values are usually expressed in millimeters of mercury (mmHg). The higher the vapor pressure, the more easily it will enter the atmosphere when left exposed.

Water Reactive:
A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

EXHIBIT I

Examples of Labels

The NIH-HCP requires that all containers of hazardous chemicals be labeled, tagged or marked with the identity of the material and appropriate hazard warnings. For chemicals purchased from a manufacturer, importer or distributor, the original label on the container is required to provide the necessary identification and hazard warning information. In most work locations at the NIH, the original container label will be adequate in meeting the NIH-HCP labeling requirement.

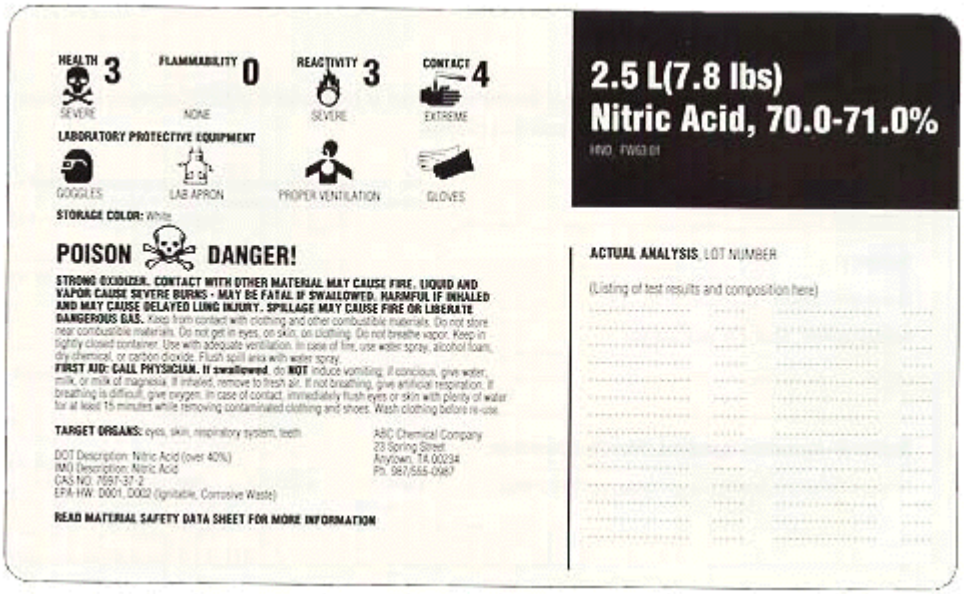
The layout and format of the information presented on a chemical container labels may vary. Chemical container labels may use words, pictures, color codes or various combinations of words and symbols to convey hazard identification and warning information. Label A provides an example of a container label for a typical laboratory chemical. Label B provides an example of a container label for a typical industrial chemical.

The specific words and symbols used on chemical container labels indicate the type of hazard present. The use of the word

- DANGER indicates that a serious potential hazard is present.
- WARNING indicates that a moderate potential hazard exists.
- CAUTION is typically used when the chemical presents a low potential hazard.

Additional information on labels and other forms of warnings is provided in the training programs offered by the DOHS.

Label A



Label B

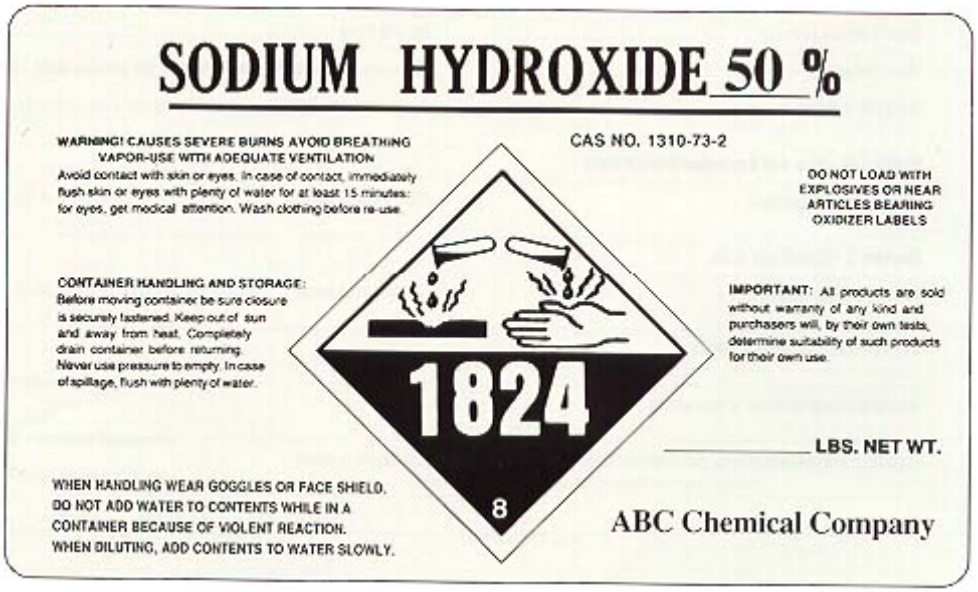


EXHIBIT 2

Material Safety Data Sheet Form

This sample MSDS identifies the key categories of information that need to be included in an MSDS whether it is developed in-house or by the manufacturer/supplier/importer of the hazardous chemical.

Note: Blanks spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.

Identity (as used on label and chemical list)

Section I

Manufacturer's Name
_____
Address (number, street. city, state, and zip)
_____
_____
_____
_____

Emergency Telephone Number
_____
Information Telephone Number
_____
Date Prepared:_____
Signature of
Preparer (Optional)_____

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (specific chemical identity- common name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% optional

Section III - Physical/Chemical Characteristics

Boiling Point_____ Specific Gravity (H,O =1)_____

Vapor Pressure (mm Hg)_____ Melting Point_____

Vapor Density (air =1)_____ Evaporation Rate (butyl acetate =1_____

Solubility in Water_____ Appearance and Odor_____

Section IV - Fire and Explosion Hazard Data

Flash Point (method used) Flammable Limits LEL UFL

Section V - Reactivity Data

Stability (unstable/stable) Conditions to Avoid

Incompatibility (materials to avoid)

_____

Hazardous Decomposition or Byproducts

_____

Hazardous Polymerization (may occur/will not occur) Conditions to Avoid

_____

_____

_____

Section VI - Health Hazard Data

Route(s) of Entry (inhalation/skin/ingestion)

_____

Health Hazards (acute and chronic)

_____

Carcinogenicity (NTP/IARC monographs/OSHA -regulated)

_____

_____

Signs and Symptoms of Exposure

_____

_____

Medical Conditions Generally Aggravated by Exposure

_____

_____

Emergency and First Aid Procedures

_____

_____

Section VII - Precautions for Safe Handling and Use

Steps To Be Taken in Case Material is Released or Spilled

_____

_____

Waste Disposal Method

_____

_____

Precautions To Be Taken in Handling and Storing

_____

_____

Other Precautions

_____

_____

Section VIII - Control Measures

Respiratory Protection (specify type):
Ventilation (local exhaust/general mechanical/other):
Protective Clothing/Equipment (gloves/eyewear/other):
Work/Hygienic Practices: