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| Johns Hopkins Safety Manual | <i>Policy Number</i> | HSE 703 |
| <i>Subject:</i> | <i>Last Review Date</i> | 09/23/08 |
| Management of Hazardous Chemicals | <i>Page</i> | 1 of 4 |

POLICY

It is the policy of Johns Hopkins that flammable liquids, toxic chemicals and highly reactive chemicals identified as hazardous substances by the Environmental Protection Agency (EPA)¹, OSHA/MOSH^{2,3,4}, the State of Maryland Department of Health and Mental Hygiene (DHMH), or the State of Maryland Department of the Environment (MDE)^{5,6} shall be handled in a manner which poses no substantial hazard to human health and shall not be deliberately discarded with the general waste or by any route into the sanitary sewer system. The handling and disposal of these materials shall be in compliance with this Policy and Federal and State regulations to assure that hazardous materials generated in the activities of Johns Hopkins do not pose a substantial hazard to human health and the environment.

Furthermore, it is the policy of Johns Hopkins to encourage the minimization of hazardous waste generated from patient care, research and teaching activities.

DEFINITION

Hazardous material: Any chemical which poses a hazard to health, property, or the environment.

GUIDELINES

A. Transportation of Hazardous Chemicals

1. All hazardous material shall be transported within secondary containment of sufficient size to hold the entire contents in the event of a spill or leak.
2. Under no circumstances are containers to be carried solely by the neck ring. Large volumes or numerous bottles should be transported on carts. Carts used for transporting hazardous materials should have sides of sufficient height to restrain containers on the cart. The wheels of the cart should be of adequate diameter to assure smooth travel throughout the route of transport.
3. At no time shall hazardous materials be left unattended during transport. Additionally, hazardous materials must not be left unattended outside any hazardous material collection location.
4. Routes of transport for hazardous materials shall be planned to minimize exposure to personnel and patients in the event of a spill.
5. Those transporting hazardous materials should use the freight elevators. If passenger elevators must be used to transport hazardous materials, only empty elevators are to be boarded. Passengers attempting to use the elevator shall be requested to wait for another elevator.
6. In the event of a spill of hazardous material, The Johns Hopkins Institutions procedure for spills found in this policy is to be followed.

B. Storage of Hazardous Chemicals

1. All chemicals should be dated when received and again when opened.
2. Flammable materials in containers larger than one gallon shall be stored in approved flammable material storage cabinets. See HSE 402: Policy on Use and Storage of Flammable Materials.
3. Peroxide forming compounds (e.g, ether, dioxane, THF) shall be disposed six months after opening, before the manufacturer's expiration date, or, given the absence of a date, one year after receipt.
4. Acids and bases shall not be stored with flammable materials in flammable cabinets. Acids should be segregated from bases.
5. Incompatible chemicals shall not be stored together. For further information on chemical incompatibilities call HSE 5-5918.
6. Stored chemicals should be evaluated annually to determine suitability and integrity for continued use.
7. Chemicals that have been stored for 10 years should be sent for disposal via the Johns Hopkins Hazardous Materials Program.
8. A sufficient supply of absorbents and neutralizers should be available at all chemical storage location for use in the event of a spill.

| | | |
|------------------------------------------|-------------------------|----------------|
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| <i>Subject:</i> | <i>Last Review Date</i> | 09/23/08 |
| Management of Hazardous Chemicals | <i>Page</i> | 2 of 4 |

C. Use of Hazardous Material

1. When working with a hazardous material, work practices as directed by the MSDS should be followed.
2. Volatile chemicals with an OSHA Permissible Exposure Level (PEL) of 50 ppm or less should be handled within a chemical fume hood.
3. A sufficient supply of absorbents and neutralizers should be available for use in the event of a spill.

D. Excess Hazardous Chemicals

1. All chemicals should be collected for disposal in a container of the same material as that in which they were delivered, or in an approved safety can for flammable liquids.
2. Whenever possible, different types of excess flammable liquid should be collected separately.
3. Mixtures of flammable liquids and corrosive chemicals should be collected separately and should not be collected in metal containers.
4. The contents of all containers must be clearly identified.
5. Toxic, highly reactive or corrosive chemicals should be collected in compatible containers and labeled with all contents clearly identified.
6. Individual chemicals (or reagents containing hazardous chemicals) should be collected and should not be mixed for disposal.
7. Corrosives (or solutions containing corrosives) should be collected in glass or chemical resistant plastic containers.

E. Disposal of Hazardous Materials

1. Excess hazardous material must be disposed of in accordance with Federal and State guidelines. Unwanted chemicals must be disposed through the Johns Hopkins Hazardous Material Disposal Program.
2. Materials in any of the following categories must be disposed of as hazardous materials:
 - a. Ignitable - any substance with a flash point below 60oC (140o F).
 - b. Corrosive - any substance with pH of less than or equal to 2.0 or greater than or equal to 12.5.
 - c. Reactive - any substance which is unstable, reacts violently with water, forms potentially explosive mixtures with water, generates toxic gases, vapors or fumes when mixed with water or exposed to a pH between 2.0 and 12.5, or capable of detonation or explosive decomposition or reaction.
 - d. Toxic - any substance which contains any of the compounds listed by the EPA under the Resource Conservation and Recovery Act at or greater than the listed concentration.
 - e. Specific chemicals - any substance containing an EPA listed compound.
3. All containers of excess chemicals must contain the following information.
 - a. Specific chemical name (in English). If a mixture, list the components and percentage composition. Non-specific identifiers (i.e mixed solvents, mixed aqueous solutions) will be treated as Unknowns (See Section F below)
 - b. Contact name (Principal Investigator or their designee).
 - c. Location of lab (Building/room number)
 - d. Lab phone number

F. Disposal of Unknown Hazardous Materials

Under the Resource Conservation and Recovery Act (RCRA), all chemicals must be properly identified before proper disposal. "Unknown" materials cannot be disposed until they have been properly characterized with appropriate documentation. The procedure for disposing of "unknowns" is as follows.

1. Bring the unknown material in a sealed container to HSE during hazardous materials receiving hours along with a completed M&S or Requisition Form. Unknown materials will not be accepted without a completed form.
2. HSE will deliver a sample of the material to an independent lab for analysis. HSE will hold the remaining material in an approved chemical accumulation area.
3. Upon receipt of lab results, HSE will inform the Department Administrator of the results and dispose of the material appropriately.

| | | |
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| <i>Subject:</i> | <i>Last Review Date</i> | 09/23/08 |
| Management of Hazardous Chemicals | <i>Page</i> | 3 of 4 |

G. Employee Protection

1. When working with a hazardous material the minimum personal protective equipment shall be:
 - i. lab coat or other protective clothing
 - ii. safety glasses or splash goggles
 - iii. gloves
2. Personal protective equipment shall not be worn outside the lab or work area.
3. HSE may require modifications to the work area or personal protective equipment to assure protection of personnel. Personal protective equipment may include gloves, eye protection, protective clothing, and/or respiratory protection. All personnel requiring respiratory protection will be enrolled in the Johns Hopkins Respiratory Protection Program managed by HSE.

PROCEDURES

Chemical Spill Procedure

1. EVALUATE THE SPILL
 - a. Are the materials Innocuous, Corrosive, Flammable, Toxic or Explosive?
 - b. Identify all materials by common or chemical name.
 - c. Estimate how much is spilled.
 - d. Evaluate the degree of danger to patients, staff or visitors.
 - e. Evaluate the degree of danger to equipment or property.
2. CONTAIN THE SPILL. Utilize any action designed to prevent the spilled material from spreading and causing increased damage.
3. EVACUATE the area if the spill cannot be contained, OR if the spilled material produces irritating odors, flammable vapors or explosive vapors. (extinguish all spark or ignition sources).
4. CLEAN up the spilled material.
 - a. Spills of innocuous material can be cleaned up by laboratory personnel or equipped staff.
 - b. Spills of acids, bases and flammables and mercury can be cleaned up by laboratory personnel using appropriate neutralizers/absorbents and proper personal protective equipment.
 - c. Spills of toxic or explosive material, and large spills of corrosive or flammable materials shall be handled by HSE. Immediately call the Emergency Telephone Number for your campus: East Baltimore - 5-4444; Homewood - 911; Other Buildings - 911. Have the following information available:
 - Your name and phone number.
 - Precise location of spill.
 - Exact description of what was spilled (make sure you state any compounds which may form toxic compounds).
 - Any steps you have taken to control the spill.
 - Any injuries that have occurred.
5. DISPOSE of all contaminated materials in accordance with this Policy.
6. Employees who have been exposed to hazardous chemicals due to a spill or other uncontrolled situation shall promptly report to the Occupational Injury Clinic for their campus or to an Adult Emergency Room when the Clinic is not operating. A Report of Incident shall be completed by the individual's supervisor.
7. Consult HSE at 5-5918 with any question regarding chemical spills and spill clean up.

REFERENCES

1. Environmental Protection Agency (40 CFR 261) Identification of Hazardous Waste.
2. OSHA Hazard Communication 29 CFR 1910.1200.
3. OSHA Exposure to hazardous chemicals in the laboratory 29 CFR 1910.1045.
4. MOSH - Occupational Safety and Health Law and Regulation, Article 89 annotated code of Maryland.
5. Department of the Environment (COMAR 26.13.02) Identification and Listing of Hazardous Waste.
6. Department of the Environment (COMAR 26.13.03) Standards Applicable to the Generators of Hazardous Waste.

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| <i>Subject:</i> | <i>Last Review Date</i> | 09/23/08 |
| Management of Hazardous Chemicals | <i>Page</i> | 4 of 4 |

7. Johns Hopkins Safety Manual: Use and Handling of Flammable Material, HSE 401
8. Resource Conservation and Recovery Act, US EPA 40 CFR 262.11 Hazardous Waste Determination

RESPONSIBILITIES

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| All Staff | <p>Handle hazardous chemicals in accordance with applicable Federal and State guidelines and this policy.</p> <p>Dispose of all hazardous chemicals in accordance with applicable Federal and State guidelines and this policy.</p> <p>Work in a manner as to minimize exposure to other personnel and to prevent contamination of the surrounding area.</p> <p>Follow the procedure found in this policy in the event of a spill.</p> <p>Wear the proper personal protective equipment as stated in the Material Safety Data Sheet (MSDS), or any additional personal protective equipment required by the employee's supervisor.</p> |
| Health, Safety and Environment | <p>Develop and implement a Hazard Communication Plan.</p> <p>Monitor compliance with this policy during environmental surveys.</p> <p>Establish and manage a Hazardous Material Disposal Program.</p> <p>Assure the appropriate disposal of all excess chemicals in compliance with existing EPA, MDE and DHMH regulations.</p> <p>Evaluate the work place and work practices. If monitoring of an employee's potential exposure to chemicals is warranted, coordinate personnel monitoring with the department head or principle investigator.</p> |
| Occupational Health Services | <p>Provide medical surveillance or medical consultation required under Federal or State Regulation.</p> |
| Departmental Management | <p>Enforce this policy.</p> <p>Provide appropriate personal protective equipment for employees and enforces its use.</p> <p>Contact HSE as necessary for evaluation of hazardous chemical procedures or with questions regarding employee protection from hazardous chemicals.</p> |
| Principal Investigator and Faculty Member | <p>Enforce this policy.</p> <p>Provide appropriate personal protective equipment for employees and enforces its use.</p> <p>Contact HSE as necessary for evaluation of hazardous chemical procedures or with questions regarding employee protection from hazardous chemicals.</p> <p>Evaluate procedures to determine if steps can be taken to minimize wastes generated, either through process changes or utilization of "less hazardous" material.</p> |

REVIEW CYCLE

Annually