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Chemical Spill Procedures

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I. Procedure for Chemical Spill on a Person

- A. Know where the nearest eyewash and safety shower are located.
- B. For small spills on the skin, flush immediately under running water for at least fifteen minutes, removing any jewelry that might contain residue. If there is no sign of a burn, wash the area with soap under warm running water.
- C. If pain returns after the fifteen-minute flooding, resume flooding the area. When providing assistance to a victim of chemical contamination, use appropriate personal protective equipment.
- D. For a chemical splash in the eyes, immediately flush the eyes under running potable water for fifteen minutes, holding the eyes open and rotating the eyeballs. This is preferably done at an eyewash fountain with tepid water and properly controlled flow. Hold the eyelids open and move the eye up, down, and sideways to ensure complete coverage. Use an irrigator loop to thoroughly flush the conjunctiva under the upper eyelid, if available in your first aid kit. If no eyewash fountain is available, put the victim on his or her back and gently pour water into the eyes for fifteen minutes or until medical personnel arrive.
- E. For ingestion, encourage the victim to drink large amounts of water. Do not induce vomiting, unless instructed to do so by the Safety Data Sheet (SDS) or other credible source.
- F. Consult the SDS to see if any delayed effects should be expected and keep the SDS with the victim. Call University Police at 704-687-2200 or 911 to have the victim taken to the Student Health Center. Be sure to inform emergency personnel of the decontamination procedures used prior to their arrival (i.e., flushing for fifteen minutes with water). Be certain that emergency room personnel are told exactly what the victim was contaminated with so they can treat the victim accordingly.

II. Incidental Spills – Procedure for Small, Low-Toxicity Chemical Spills

- A. Be prepared. Keep appropriate spill-containment material on hand for emergencies. Consult with the Environmental Health and Safety office (EHS), 704-687-1111 or, if in the Chemistry Department, the stockroom manager. Do not contact Housekeeping staff or Building Environmental Services to assist with the spill cleanup.
- B. Laboratory workers must receive training to distinguish between the types of spills they can handle on their own and those spills that are classified as "MAJOR." Major spills dictate the need for outside help. **Note: See major spills – criteria for response level.**

- C. Laboratory workers are qualified to clean-up spills that are "incidental." The Occupational Safety and Health Administration (OSHA) has enacted the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard and in doing so, **defines an incidental spill as a spill that does not pose a significant safety or health hazard to employees in the immediate vicinity, nor does it have the potential to become an emergency within a short time frame.**
- D. The period that constitutes a short time is not defined. Laboratory workers can handle incidental spills because they are expected to be familiar with the hazards of the chemicals they routinely handle during an "average" workday.
- E. If the spill exceeds the scope of the laboratory workers experience, training, or willingness to respond, the workers must be able to determine that the spill cannot be dealt with internally.

III. Incidental Spills – Steps to be followed for Spill Clean-Up

The following steps shall be followed for incidental spills:

- A. Alert people in the area that a spill has occurred.
- B. Evaluate the toxicity, flammability, and other hazardous properties of the chemical as well as the size and location of the spill (i.e., chemical fume hood or elevator) to determine whether evacuation or additional assistance is necessary. Large or toxic spills are beyond the scope of this procedure.
- C. Contain any volatile material within a room by keeping door/s closed. Increase vapor capture efficiency by minimizing sash height of the chemical fume hood or activating the emergency purge, if available. For volatiles, turn off any sources of ignition.
- D. Consult your SDS, the laboratory emergency plan, or procedures in this document, or call EHS for correct cleaning procedures.
- E. Locate the available spill kit and evaluate its abilities to assist with the incidental spill. If necessary, obtain additional cleaning equipment and protective gear from EHS or chemistry stockroom. Wear protective equipment such as goggles, apron, laboratory coat, gloves, shoe covers, or respirator. Base the selection of the equipment on the hazard.
- F. First, cordon off the spill area to prevent inadvertently spreading the contamination over a much larger area.
- G. Absorb liquid spills using spill pillows, vermiculite, or sand. Place the spill pillow over the spill and draw the free liquid into the pillow. Sprinkle vermiculite or sand over the surface of the free liquid.

- H. Place the used pillows or absorbent materials in plastic bags/buckets for disposal along with contaminated disposable gear, such as gloves. Mark all bags/buckets with a hazardous waste label detailing the waste contents and hazards.
- I. Neutralize spills of corrosives and absorb, if appropriate. Sweep up waste and place it in plastic bags/buckets for disposal. Mark all bags/buckets with a hazardous waste label detailing the waste contents and hazards.
- J. Complete the EHS waste pick-up electronic form through EHSA Onsite or contact EHS directly for waste collection. EHS will pick up the waste materials and transfer them to a Central Accumulation Area (CAA).
- K. Accidents or near accidents should be carefully analyzed in tandem with EHS, with the results distributed to all who may benefit.

IV. Major Spills – Criteria for Response Level

A. Emergency assistance is provided by Charlotte – Mecklenburg Fire Department/Hazardous Materials Team, EHS and outside contractors, if deemed necessary. Spills requiring the involvement of individuals outside the lab are those exceeding the size and scope of spills one would expect during the normal course of work. Spills in this category are those which have truly become emergency situations in that laboratory workers are overwhelmed beyond their level of training. Their response capability is compromised by the magnitude of the incident. For these types of spills, please refer to Campus Police at 704-687-2200 or 911 from a campus phone.

1. Factors that clearly indicate a major spill are:
 - a. The need to evacuate employees in the area;
 - b. The need for response from outside the immediate release area;
 - c. The release poses, or has potential for conditions that are immediately dangerous to life and health;
 - d. The release poses a serious threat of fire and/or explosion;
 - e. The release may cause high levels of exposure to toxic substances;
 - f. There is uncertainty that the worker can handle the severity of the hazard with the Personal Protective Equipment (PPE) and

equipment that has been provided and the exposure limit could be easily exceeded;

- g. The situation is unclear or data is lacking regarding important factors.

V. Medical Surveillance for Chemical Exposure

- A. If a laboratory worker develops signs or symptoms associated with a hazardous chemical to which the lab worker may have been exposed, they shall be provided the opportunity to receive an appropriate medical examination. If exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL) for an OSHA regulated substance for which there are medical surveillance requirements, medical surveillance shall be established for the lab worker as prescribed by the particular standard. If an event takes place in the lab such as a spill, leak, explosion or other occurrence resulting in the likelihood of hazardous exposure, the affected lab workers shall be provided with the opportunity for a medical examination.
- B. Anyone who believes they are exposed to, or whose work involves regular and frequent handling of, toxicologically significant quantities of a chemical, should contact the Student Health Center for referral to a qualified physician to determine on an individual basis whether a regular schedule of medical surveillance is warranted.

APPENDIX A: Quick Reference for Spill Clean-Up

Chemical Spilled	Clean-Up Procedure
Acids, organic	Apply sodium bicarbonate. Absorb with spill pillow or vermiculite.
Acids, inorganic	Apply sodium bicarbonate/calcium oxide or sodium carbonate/calcium oxide. Absorb with spill.
Acid chlorides	Do not use water. Absorb with sand or sodium bicarbonate.
Aldehydes	Absorb with spill pillow or vermiculite.
Aliphatic amines	Apply sodium bisulfite. Absorb with spill pillow or vermiculite.
Aromatic amines	Absorb with spill pillow or vermiculite. Avoid skin contact or inhalation.
Aromatic halogenated	Absorb with spill pillow or vermiculite. Avoid skin contact or inhalation.
Azides (potential explosives)	Absorb with spill pillow or vermiculite. Decontaminate with 10% ceric ammonium nitrate solution.
Bases (caustic alkalis)	Neutralize with acid or commercial chemical neutralizers and absorb with spill pillow or vermiculite.
Carbon disulfide (flammable and Chlorohydrins	Absorb with spill pillow or vermiculite.
Cyanides	Absorb with spill pillow or vermiculite. Avoid skin contact or inhalation.
	Wet or mist solids before sweeping or use a HEPA filter vacuum to collect the solids. Absorb liquids with spill pillow or vermiculite.

Halides, organic or inorganic	Apply sodium bicarbonate.
Halogenated hydrocarbons	Absorb with spill pillow or vermiculite.
Hydrazine	Absorb with spill pillow or vermiculite. Avoid organic matter.
Hydrofluoric acid	Absorb with calcium carbonate (limestone) or lime (calcium oxide) rather than sodium bicarbonate. The use of sodium bicarbonate will lead to the formation of sodium fluoride, which is considerably more toxic than calcium fluoride. Be careful in the
Inorganic salt	Apply soda ash.
Mercaptans/organics	Neutralize with calcium hypochlorite solution. Absorb with spill pillow or vermiculite.
Nitriles	Sweep up solids. Absorb liquids with spill pillow or vermiculite.
Nitro compounds, organic nitros	Absorb with spill pillow or vermiculite. Avoid skin contact or inhalation.
Oxidizing agents	Apply sodium bisulfite.
Peroxides	Absorb with spill pillow or vermiculite.
Phosphates, organic	Absorb with spill pillow or vermiculite.
Reducing	Apply soda ash or sodium bicarbonate.
Reference: <i>Reagent Chemicals</i> , MCB Manufacturing Chemists, Inc., 1981, pp. 359-402.	

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