

CHEMICAL HYGIENE PLAN

LEBANON PUBLIC SCHOOLS

October 2013

Chemical Hygiene Policy Statement

Chemical Hygiene Officer Appointment

In compliance with the Federal Laboratory Standard Lebanon Public Schools realizes our responsibility for the protection of our employees. We hereby institute the enclosed Chemical Hygiene Plan to assist us in our safety program.

Lebanon Public Schools hereby appoints Karen Collins to be our Chemical Hygiene Officer. We acknowledge the Chemical Hygiene Officer has the knowledge and authority to implement and enforce our Chemical Hygiene Plan.

Janet M. Tyler
Superintendent of Schools

October 15, 2013
Date

Chemical Hygiene Plan Overview

I. Standard Operating Procedures

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- B) General Laboratory Rules and Procedures
- C) Personal Hygiene Guidelines
- D) Protective Clothing Requirements
- E) Housekeeping Rules
- F) Spill and Accident Procedures
- G) Chemical Storage Rules and Procedures
 - 1) Compressed Gas Handling Instructions
 - 2) Flammable Chemical Handling Instructions
 - 3) Corrosive Material Handling Instructions
- H) Procedure—Specific Safety Rules and Guidelines (Including Severely Toxic and Carcinogenic Substances)
- I) Safety Equipment Inspection
 - 1) Fume Hoods
- J) Chemical Procurement and Distribution

II. Employee Training

III. Exposure Evaluations

IV. Medical Evaluations

V. Monitoring

VI. Emergency Evacuation Plan

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I. Standard Operating Procedures

A) General Employee Rules and Procedures

- 1) Minimize all chemical exposures.
- 2) Skin contact with chemicals should be avoided.
- 3) Read all chemical labels before use and identify chemical hazards and risks.
- 4) All students and teachers shall wear goggles during laboratory activities that are designated as hazardous. Chemical splash goggles must be worn any time chemicals, glassware, or heat are used in the laboratory.
- 5) Never work alone in the laboratory, chemical storage, or prep areas.
- 6) Flammable liquids require special attention. Never use these materials near any source of ignition, spark or open flame.
- 7) Never perform a first-time chemical demonstration in front of your class. Always perform first-time demonstrations in front of other instructors to evaluate the safety of the demonstration.
- 8) Never store chemicals over, under, or near a sink.
- 9) Only authorized personnel should be allowed in the chemical storeroom. Students should never be allowed in the chemical storeroom.
- 10) Each science laboratory shall be equipped with a fire blanket and eye wash station.
- 11) Train all students on how to use all safety devices in the laboratory (e.g. eyewash, emergency shutoffs, etc.) and teach all students and employees to find the safety devices quickly in an emergency.
- 12) In the event of a power failure, ensure all equipment is turned off that could become hazardous when the power returns.
- 13) Every employee teaching in a science classroom should familiarize themselves with where and how to use master utility controls to shut off gas, electrical, and water supplies.
- 14) Do not smell or taste chemicals.
- 15) Use a safety shield whenever an explosion or implosion might occur.

- 16) Know and understand the hazards of the chemical you will be using as stated in the SDS and other references.
- 17) Use protective safety equipment to reduce potential exposure, i.e. gloves, respirators, fume hood, etc.
- 18) Know the locations for all personal safety and emergency equipment, eye wash, shower, fire extinguisher and spill control materials.
- 19) Know how to properly store all chemicals in their compatible chemical families. (Consult the Flinn Chemical Catalog/Reference Manual for details.)
- 20) Know proper transportation and disposal procedures for chemicals.
- 21) Know appropriate emergency procedures, waste disposal, spill clean up, evacuation routes, and fire emergency notification.
- 22) Know and understand the personal hygiene practices outlines in the Chemical Hygiene Plan

B) General Laboratory Rules and Procedures

- 1) First aid in the classroom is limited to small cuts that can be covered with a band-aid. Any chemical exposure, burn, or other injury should be referred to the school nurse.
- 2) The laboratory should be well ventilated. A ventilation fan which can remove the air a minimum of 8 air changes per hour when occupied. Air for laboratory ventilation shall directly flow into a laboratory from non-laboratory areas and out to the exterior of the building. Ventilation must be checked a minimum of every 3 months, and a record maintained.
- 3) Post emergency telephone numbers in the chemical stores area. Have a telephone or some means of emergency communication in the laboratory, chemical storage area, and prep area.
- 4) Do not use chipped, etched, or cracked glassware. Glassware which is chipped or scratched presents a serious breakage hazard when heated or handled.
- 5) All laboratories must have an eyewash capable of treating both eyes continuously for 15 minutes with copious quantities of potable water. Teach everyone how to use the eyewash quickly in case of an emergency. Eyewash effectiveness and operation should be inspected every month. Tank-style eyewash stations should have the fluid changed every 90 days. This will be recorded on the side of the eye wash station.
- 6) In the event of an accident, when time allows, fill out an accident report describing the event in detail. Copy in the building principal, the superintendent, and the CHO.
- 7) Read all labels carefully – the names of many chemicals look alike at first glance.
- 8) Do not operate electrical equipment with wet hands.

- 9) Have appropriate types and sizes of fire extinguishers. Triclass ABC and Halon fire extinguishers are appropriate for laboratories. Carbon Dioxide fire extinguishers are inappropriate for laboratories. A Class D fire extinguisher should be available when working with flammable solids. Fire extinguishers should be inspected every six months.
- 10) Do not block fire exits.
- 11) Have an alternative evacuation route in the event your primary route becomes blocked.
- 12) Practice your emergency plans.
- 13) Do not drink from lab glassware or other lab vessels.
- 14) No food in the laboratory. Do not eat, drink or chew gum in the laboratory.
- 15) Do not apply cosmetics in areas where laboratory chemicals are present.
- 16) Keep all aisles clear.
- 17) Do not run in the laboratory.
- 18) No unlabeled products should be stored anywhere in the science facility.
- 19) Be thoroughly familiar with the hazards and precautions for protection before using any chemical. Study the precautionary label and review its contents before using any chemical substance.
- 20) An approved eyewash station and fire blanket should be within 25 feet of the chemical stores area.
- 21) Neutralizing chemicals, such as a spill kit, dry sand, kitty litter, and other spill control materials should be readily available.
- 22) Safety showers or body drenches should be provided. Showers should be tested every six months. Promptly repair any shower or body drench which does not meet the water flow requirements of ANSI Z358.1.
- 23) Access to exits, emergency equipment, and master utility controls should never be blocked.
- 24) Avoid the use of contact lenses in the laboratory. If contact lenses must be worn, the science teacher must be informed so special precautions can be taken.
- 25) Never perform unauthorized laboratory experiments.

C) Personal Hygiene Guidelines

- 1) Do not apply cosmetics or smoke, eat, chew, or drink in the laboratory.
- 2) Do not pipet by mouth – always use a pipet bulb or other appropriate suction device.
- 3) Wash thoroughly after any chemical exposure and before leaving the laboratory with soap and water.
- 4) Never smell chemicals directly; always waft the odors to your nose using your hand.
- 5) Never bring foodstuffs, opened or closed, into the lab, chemical prep, or storage area. Foodstuffs should not be eaten if in a room with toxic materials.

D) Protective Clothing Requirements

- 1) Eye protection must be worn when working with chemicals. Chemical splash goggles must meet ANSI Z87.1 Standard. Wear face shields when dealing with corrosive liquids, (i.e., full strength acids and bases).
- 2) Wear gloves which offer protection for all hazards you may find in the lab. Test for holes every time you wear your gloves.
- 3) Always wear a full length lab coat or a chemical-resistant apron when working with chemicals.
- 4) Always wear low-heeled shoes. Do not wear open-toed shoes or sandals of any kind. Always wear socks in the laboratory.
- 5) Never block access to emergency exits or equipment.
- 6) Clean up all spills properly and promptly.
- 7) Do not wear loose or balloon sleeves.
- 8) Tie back long hair.
- 9) Do not wear hanging jewelry.
- 10) Do not wear a long or loose necktie.
- 11) Do not wear an absorbent watch strap.
- 12) Inspect all protective safety equipment before use. If defective, do not use.

E) Housekeeping Rules

- 1) Keep chemicals in the chemical prep and storage area. If chemicals are moved to the classroom for lab, they must be returned to their proper storage location at the end of the day's laboratory periods.
- 2) Waste materials require proper containers and labels.
- 3) Do not store items in the fume hood. The storage of items in the fume hood is a fire hazard and decreases the efficiency of the fume hood.
- 4) Label all chemicals with:
 - a. chemical name or identity of contents
 - b. concentration
 - c. hazard information including flammability, reactivity, health, and other hazards (i.e. target organs)
 - d. initials of preparer and date prepared (month/year)
- 5) Never block access to exits or emergency equipment.
- 6) Clean up all spills properly and promptly.
- 7) Work and floor surfaces should be cleaned regularly and kept free of clutter.

F) Spill and Accident Procedures

- 1) Notify – Call for help. Evacuate – Get everyone to a safe location. Assemble – Organize the students and all workers. Report – Fill out a detailed accident report after the emergency is over.
- 2) Clean up spills immediately and thoroughly. Follow approved spill cleanup procedures, spills should only be cleaned up by approved personnel.
- 3) Neutralizer for both acid and base spills should be available in the event of a chemical spill.

G) Chemical Storage and Transportation Rules and Procedures

- 1) An updated inventory of all chemicals, their amounts and location shall be kept by each teacher in their rooms. Stored chemicals should be examined annually for replacement, deterioration, and chemical integrity.
- 2) Label all chemical solutions you make with the name of the contents, date, concentration, hazard information and your name. See GHC labeling.
- 3) Date label all chemicals with the purchase date. This will allow anyone to determine the age of a substance at a later date.
- 4) Establish a separate and secure storage area for chemicals.

- 5) Do not allow incoming shipments of chemicals to be opened and transported by school personnel other than qualified science teachers.
- 6) All chemicals should be stored in chemically compatible families. (See Flinn Chemical Catalog/Reference Manual for details)
- 7) Store the minimum amount of chemicals needed.
- 8) Store corrosives in appropriate corrosives cabinet.
- 9) No flammable materials should be stored outside an approved flammables storage cabinet unless in safety cans.
- 10) Do not store chemicals under a fume hood.
- 11) If possible, keep certain items in the original shipping package, e.g., acids and bases in the special and expensive Styrofoam cubes.
- 12) Avoid storing chemicals on shelves above eye level.
- 13) The storage area and cabinets should be labeled as to identify the hazardous nature of the products stored within. This will allow fire department officials to quickly see a potentially hazardous area.
- 14) Shelving above any work area, such as a sink, should be free of chemicals or other loose miscellany.
- 15) Shelving sections should be secured to walls or floor to prevent tipping of entire sections.
- 16) Shelves should be equipped with lips to prevent containers from rolling off.
- 17) Chemicals should not be stored on the floor except in approved shipping containers.
- 18) Storage area should be ventilated by at least four changes of air per hour. Isolate the chemical storage exhaust from the general building ventilation system.
- 19) Never store food in a laboratory refrigerator.
- 20) Store chemicals in a separate, locked, dedicated storeroom.
- 21) Store all poisons in a locked cabinet.
- 22) Only authorized personnel are allowed in the chemical storage area. Students should never be allowed in this area.
- 23) Chemical exposure to heat or direct sunlight should be avoided.

1. Storage Requirements – Compressed Gas Handling Instructions

- 1) Compressed gases should be handled as high energy sources, and therefore, as potential explosives.
- 2) Always protect the cylinder valve stem.
- 3) Avoid exposure of cylinders to heat. Do not store gas cylinders in direct sunlight.
- 4) Never lubricate, modify, force, or tamper with a cylinder valve.
- 5) Cylinders of toxic, flammable or reactive gases should be used only under a fume hood.
- 6) Do not extinguish a flame involving a combustible gas until the gas is shut off – otherwise it can reignite – possibly causing an explosion.
- 7) Gas cylinders must be secured in place. They must be protected to prevent valve damage which may be caused by falling.

2. Storage Requirements – Flammable Chemicals Handling Instructions

- 1) Store all flammables in a dedicated flammables cabinet.
- 2) Keep cool, between 55°F and 80°F, at all times.
- 3) Store away from all sources of ignition.
- 4) Store away from all oxidizers.
- 5) Never store flammables in refrigerators unless the refrigerator is explosion proof.
- 6) Avoid storing any chemicals, especially flammable materials, in direct sunlight.

3. Storage Requirements – Corrosive Materials Handling Instructions

- 1) Store corrosives in appropriate corrosives cabinets.
- 2) If possible, keep certain items in the original shipping package, e.g., acids and bases in the special and expensive Styrofoam cubes.
- 3) Working with corrosive materials requires special eyewear. Wear a chemical splash faceshield when handling corrosive materials.
- 4) At least every three months inspect all shelf clips in the acid cabinets to check for possible corrosion. These shelf clips are the only thing between you and a collapsed shelf. They require special attention.

H) Procedure Specific Safety Rules and Guidelines (for extremely hazardous chemicals)

- 1) The decision to use a particular substance will be based on the best available knowledge of each chemical's particular hazard and the availability of proper handling facilities and equipment. Substitutions, either of chemicals, demonstrations, or experiments, will be made where appropriate to reduce hazards without sacrificing instructional objectives. When the risk outweighs the benefit and no substitute is available, then the experiment, demonstration, procedure, or chemical should be eliminated.
- 2) Use a fume hood when the permissible exposure limit for a chemical is less than 50 ppm as indicated on the chemical MSDS.
- 3) Use carcinogens, mutagens, teratogens, and allergens only under a fume hood.
- 4) Handle toxic, corrosive, flammable and noxious chemicals under a fume hood.
- 5) Do not expose flammable liquids to open flame, sparks, heat or any source of ignition.
- 6) Only use flammable solids (sodium, potassium, lithium, etc.) in very small quantities. Use a safety shield when igniting flammable solids. A type D fire extinguisher or equivalent is required when possessing these flammable solids.
- 7) Water-reactive solids (sodium metal, potassium metal, etc.) should be stored under dry oil.
- 8) Use extreme caution when handling finely divided (dust-like) material. Finely divided materials may form explosive mixtures with air.
- 9) Open cans of ether (ethyl ether) should be properly disposed of after use and not stored unless absolutely necessary. Rely on expiration date to dispose of the material.
- 10) Glycerin should be available only to the instructor.

I) Safety Equipment Inspection

The Laboratory Standard requires that if you have a piece of safety equipment, it must be functional at all times. This statement applies to all safety equipment, required or recommended.

All safety equipment must be inspected every three months at the minimum. A record of these inspections must be kept near the equipment. Any safety equipment failing this quarterly inspection or reported to be out of order at any time must be repaired immediately. Any safety equipment found to out of order is in serious violation of the Laboratory Standard.

- 1) Goggles always must be clean and functional.
- 2) Laboratory ventilation must meet the standard of eight air changes per hour and must be tested quarterly.
- 3) Fire extinguishers must be of the right type, Tri-class ABE, and they must always be properly inspected.
- 4) Eyewashes must be functional and flushed at least once a month.

1. Fume Hoods

Like all engineering controls, fume hoods need to be kept in good operating condition.

- 1) Make sure there is at least an annual inspection of the hoods for proper preventative maintenance. This should include re-calibration to ensure proper function.
- 2) Filters: Filters should also be part of the inspection process. Included in this should be air flow patterns and measurement of face velocities.
- 3) Chamber: Before using the fume hood, the chamber should be inspected. Make sure nothing is blocking the baffle, air foils, or bypass. The hood should be drawing air. For most operations, a face velocity of 100 fpm is sufficient.
- 4) Fume hoods must be operational at the level of 70-100 linear feet per minute as measured by a velometer.
- 5) Air flow velocity should be measured prior to fume hood use.

J) Chemical Procurement and Distribution

- 1) The purchasing of chemicals for science demonstrations and experimentation should be approved by the CHO prior to ordering. This will be to ensure that minimum amount of chemicals are kept on hand (reduce double ordering), and to limit purchasing hazardous or difficult to dispose of chemicals.
- 2) The decision on what and how much of a chemical to order will be determined between the CHO and the members of the science department.
- 3) No chemicals shall be brought into the district without prior notification to the CHO.

II. Employee Training

Lebanon Public Schools provided ongoing training sessions for our employees. Our training includes:

- 1) Content and location of this Chemical Hygiene Plan and The Laboratory Standard.
- 2) Potential hazards involved in using chemicals.
- 3) Signs and symptoms of overexposure to chemicals. How to detect potentially harmful exposures before they are harmful.
- 4) Location and availability of chemical Safety Data Sheets (SDS).
- 5) Understanding of the permissible exposure limits (PELs) used in the school.
- 6) The proper use and location of all safety equipment.

III. Exposure Evaluations

It is the communicated policy of Lebanon Public Schools to investigate all suspected overexposures to chemicals in a prompt and timely fashion.

In the event of an overexposure, after the immediate event, we must document all chemicals and circumstances involved in the overexposure. This information should be used to change safety practices to further improve lab safety. It is our obligation to maintain these files and make them accessible to the employees.

Signs of overexposure are numerous; they include:

- 1) Accidental breakage of a hazardous material container.
- 2) A skin rash or irritation occurring because of contact with a chemical.
- 3) Caustic splash to eyes, face, or body.
- 4) Symptoms such as nausea, dizziness, and others.

If monitoring of the air is determined to be necessary, the results of the monitoring must be made available to the employees within 2 weeks.

IV. Medical Evaluations

It is the policy of Lebanon Public Schools to make medical consultation and examination available to our employees when:

- a) Any sign or symptom of an overexposure to a chemical is present.
- b) Monitoring has indicated an overexposure to a chemical has occurred.
- c) There has been a spill or uncontrolled release of chemical fumes.

We will provide the physician with the names of chemicals used, circumstances of the exposure and all signs and symptoms of the exposure.

The medical examinations dealing with the overexposure must be documented and other employees working under the same conditions must be notified. All documentation must be kept on file and accessible by other employees working in this area.

All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay.

V. Monitoring

Monitoring will be necessary for substances regulated by a standard only if there is reason to believe that exposure levels for that substance exceed the PEL for that substance. If you have no cause to suspect a hazard or an exposure, no monitoring is necessary.

If monitoring is performed and this initial monitoring shows no evidence of exposure, the monitoring may be discontinued. If initial monitoring indicates an exposure, steps must be taken immediately to reduce the exposure to permissible limits. Monitoring must then be performed periodically to verify that the steps to reduce the exposure have been effective. Monitoring may be terminated after complying with the applicable standard for the hazardous material.

All monitoring results and activities shall be fully accessible and in full knowledge of the employee(s).

VI. Emergency Evacuation Plan

A copy of the Emergency Evacuation Plan for each laboratory will be posted in each laboratory and verified annually for its accuracy.