

1: [PDF/ePub Download] prudent practices in the laboratory eBook

Prudent Practices in the Laboratory will continue to serve as the leading source of chemical safety guidelines for people working with laboratory chemicals: research chemists, technicians, safety officers, educators, and students.

E2, E3, E4 In this appendix, those recommendations directed primarily at administrators and supervisors are given in sections A-D. Those recommendations of primary concern to employees who are actually handling laboratory chemicals are given in section E. It is prudent to minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted, rather than specific guidelines for particular chemicals 2, Skin contact with chemicals should be avoided as a cardinal rule Avoid underestimation of risk. Even for substances of no known significant hazard, exposure should be minimized; for work with substances which present special hazards, special precautions should be taken 10, 37, One should assume that any mixture will be more toxic than its most toxic component 30, and that all substances of unknown toxicity are toxic 3, The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices 32, Institute a chemical hygiene program. A mandatory chemical hygiene program designed to minimize exposures is needed; it should be a regular, continuing effort, not merely a standby or short-term activity 6, Its recommendations should be followed in academic teaching laboratories as well as by full-time laboratory workers Chemical Hygiene Responsibilities Responsibility for chemical hygiene rests at all levels 6, 11, 21 including the: Chief executive officer, who has ultimate responsibility for chemical hygiene within the institution and must, with other administrators, provide continuing support for institutional chemical hygiene 7, Supervisor of the department or other administrative unit, who is responsible for chemical hygiene in that unit 7. Chemical hygiene officer s , whose appointment is essential 7 and who must: Work with administrators and other employees to develop and Monitor procurement, use, and disposal of chemicals used in the lab 8 ; See that appropriate audits are maintained 8 ; Help project directors develop precautions and adequate facilities 10 ; Know the current legal requirements concerning regulated substances 50 ; and Seek ways to improve the chemical hygiene program 8, Laboratory supervisor, who has overall responsibility for chemical hygiene in the laboratory 21 including responsibility to: Ensure that workers know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided 21, 22 ; Provide regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment 21, ; Know the current legal requirements concerning regulated substances 50, ; Determine the required levels of protective apparel and equipment , , ; and Ensure that facilities and training for use of any material being ordered are adequate Project director or director of other specific operation, who has primary responsibility for chemical hygiene procedures for that operation 7. Laboratory worker, who is responsible for: Planning and conducting each operation in accordance with the institutional chemical hygiene procedures 7, 21, 22, ; and Developing good personal chemical hygiene habits The Laboratory Facility Design. The laboratory facility should have: Chemical-hygiene-related equipment hoods, incinerator, etc. The work conducted 10 and its scale 12 must be appropriate to the physical facilities available and, especially, to the quality of ventilation Ventilationâ€™” General laboratory ventilation. Provide a source of air for breathing and for input to local ventilation devices ; it should not be relied on for protection from toxic substances released into the laboratory ; ensure that laboratory air is continually replaced, preventing increase of air concentrations of toxic substances during the working day ; direct air flow into the laboratory from non-laboratory areas and out to the exterior of the building A laboratory hood with 2. If this is not possible, work with substances of unknown toxicity should be avoided 13 or other types of local ventilation devices should be provided Other local ventilation devices. Ventilated storage cabinets, canopy hoods, snorkels, etc. Each canopy hood and snorkel should have a separate exhaust duct Exhaust air from glove boxes and isolation rooms should be passed through scrubbers or other treatment before release into the regular exhaust system Cold rooms and warm rooms should have provisions for rapid escape and for escape in the event of electrical failure Any alteration of the ventilation system should be made only if thorough

testing indicates that worker protection from airborne toxic substances will continue to be adequate 12, , General air flow should not be turbulent and should be relatively uniform throughout the laboratory, with no high velocity or static areas , ; airflow into and within the hood should not be excessively turbulent ; hood face velocity should be adequate typically 1fm , Quality and quantity of ventilation should be evaluated on installation , regularly monitored at least every 3 months 6, 12, 14, , and reevaluated whenever a change in local ventilation devices is made 12, , Chemical Procurement, Distribution, and Storage Procurement. Before a substance is received, information on proper handling, storage, and disposal should be known to those who will be involved , No container should be accepted without an adequate identifying label Preferably, all substances should be received in a central location Toxic substances should be segregated in a well-identified area with local exhaust ventilation Chemicals which are highly toxic or other chemicals whose containers have been opened should be in unbreakable secondary containers Stored chemicals should be examined periodically at least annually for replacement, deterioration, and container integrity When chemicals are hand carried, the container should be placed in an outside container or bucket. Freight-only elevators should be used if possible Amounts permitted should be as small as practical. Storage on bench tops and in hoods is inadvisable. Exposure to heat or direct sunlight should be avoided. Environmental Monitoring Regular instrumental monitoring of airborne concentrations is not usually justified or practical in laboratories but may be appropriate when testing or redesigning hoods or other ventilation devices 12 or when a highly toxic substance is stored or used regularly e. Housekeeping, Maintenance, and Inspections Cleaning. Floors should be cleaned regularly Formal housekeeping and chemical hygiene inspections should be held at least quarterly 6, 21 for units which have frequent personnel changes and semiannually for others; informal inspections should be continual Eye wash fountains should be inspected at intervals of not less than 3 months 6. Respirators for routine use should be inspected periodically by the laboratory supervisor Other safety equipment should be inspected regularly e. Procedures to prevent restarting of out-of-service equipment should be established Stairways and hallways should not be used as storage areas Access to exits, emergency equipment, and utility controls should never be blocked Medical Program Compliance with regulations. Regular medical surveillance should be established to the extent required by regulations Anyone whose work involves regular and frequent handling of toxicologically significant quantities of a chemical should consult a qualified physician to determine on an individual basis whether a regular schedule of medical surveillance is desirable 11, Personnel trained in first aid should be available during working hours and an emergency room with medical personnel should be nearby Protective Apparel and Equipment These should include for each laboratory: Protective apparel compatible with the required degree of protection for substances being handled ; An easily accessible drench-type safety shower , ; An eyewash fountain A fire extinguisher ; Respiratory protection , fire alarm and telephone for emergency use should be available nearby; and f Other items designated by the laboratory supervisor , Records Accident records should be written and retained Chemical Hygiene Plan records should document that the facilities and precautions were compatible with current knowledge and regulations 7. Inventory and usage records for high-risk substances should be kept as specified in section E3e below. Medical records should be retained by the institution in accordance with the requirements of state and federal regulations Signs and Labels Prominent signs and labels of the following types should be posted: Spills and Accidents A written emergency plan should be established and communicated to all personnel; it should include procedures for ventilation failure , evacuation, medical care, reporting, and drills There should be an alarm system to alert people in all parts of the facility including isolation areas such as cold rooms A spill control policy should be developed and should include consideration of prevention, containment, cleanup, and reporting All accidents or near accidents should be carefully analyzed with the results distributed to all who might benefit 8, Information and Training Program Aim: To assure that all individuals at risk are adequately informed about the work in the laboratory, its risks, and what to do if an accident occurs 5, Emergency and Personal Protection Training: Every laboratory worker should know the location and proper use of available protective apparel and equipment , Some of the full-time personnel of the laboratory should be trained in the proper use of emergency equipment and procedures 6. Such training as well as first aid instruction should be available to and encouraged for everyone who might

need it. The training and education program should be a regular, continuing activity-not simply an annual presentation. Literature and consulting advice concerning chemical hygiene should be readily available to laboratory personnel, who should be encouraged to use these information resources.

Waste Disposal Program
Aim: To assure that minimal harm to people, other organisms, and the environment will result from the disposal of waste laboratory chemicals.

5. Content 14, , , The waste disposal program should specify how waste is to be collected, segregated, stored, and transported and include consideration of what materials can be incinerated. Transport from the institution must be in accordance with DOT regulations. Unlabeled containers of chemicals and solutions should undergo prompt disposal; if partially used, they should not be opened.

24, Waste should be removed from laboratories to a central waste storage area at least once per week and from the central waste storage area at regular intervals. Incineration in an environmentally acceptable manner is the most practical disposal method for combustible laboratory waste.

14, , Indiscriminate disposal by pouring waste chemicals down the drain 14,, or adding them to mixed refuse for landfill burial is unacceptable. Hoods should not be used as a means of disposal for volatile chemicals.

40, Disposal by recycling , or chemical decontamination 40, should be used when possible.

Basic Rules and Procedures for Working with Chemicals
The Chemical Hygiene Plan should require that laboratory workers know and follow its rules and procedures. In addition to the procedures of the sub programs mentioned above, these should include the rules listed below.

General Rules
The following should be used for essentially all laboratory work with chemicals:

Accidents and Spills

- Eye Contact: Promptly flush eyes with water for a prolonged period 15 minutes and seek medical attention 33,

2: Free prudent practices in the laboratory PDF

This edition of Prudent Practices in the Laboratory builds on the work provided in previous editions. Among other changes, it has two new chapters, one on Emergency Planning and one on Laboratory Security, described above, and the discussion of EHS (environment, health, and safety) management systems has been extensively revised.

Page vii Share Cite Suggested Citation: Prudent Practices in the Laboratory: The National Academies Press. Handling and Disposal of Chemicals. More than 10 years later, the Board on Chemical Sciences and Technology initiated an update and revision of the edition of Prudent Practices. The Committee on Prudent Practices in the Laboratory: An Update was established in June. The first meeting was held in August, and two subsequent meetings were held, one in October and the other in February. All meetings were held in Washington, D. The original motivation for drafting Prudent Practices and Prudent Practices was to provide an authoritative reference on the handling and disposal of chemicals at the laboratory level. These volumes not only served as a guide to laboratory workers, but also offered prudent guidelines for the development of regulatory policy by government agencies concerned with safety in the workplace and protection of the environment. Since their original publication in the early s, these reports have been distributed widely both nationally and internationally. The next volume Prudent Practices responded to societal and technical developments that were driving significant change in the laboratory culture and laboratory operations relative to safety, health, and environmental protection. Page viii Share Cite Suggested Citation: Building on this history, the updated edition of Prudent Practices in the Laboratory also considers technical, regulatory, and societal changes that have occurred since the last publication. Throughout the development of this book, the committee engaged in discussions with subject matter experts and industrial and academic researchers and teachers. The goal of these discussions was to determine what the various constituencies considered to be prudent practices for laboratory operations. Public support for the laboratory use of chemicals depends on compliance with regulatory laws, respect by organizations and individuals of the concerns of the public, and the open acknowledgment and management of the risks to personnel who work in laboratory environments. Addressing these issues is the joint responsibility of everyone who handles or makes decisions about chemicals, from shipping and receiving clerks to laboratory personnel and managers, environmental health and safety staff, and institutional administrators. Organizations and institutions must create environments where safe laboratory practice is standard practice. All of us should recognize that the safety of each of us depends on teamwork and personal responsibility as well as the knowledge of chemistry. Faculty, research advisors, and teachers should note that a vital component of chemical education is teaching students how to identify the risks and hazards in a laboratory. Such education serves scientists well in their ultimate careers in government, industry, academe, and the health sciences. Rigorous practitioners argue that, in principle, all accidental injuries are preventable if systems and attitudes are in place to prevent them. Even in these days of technological advancements, tracking of near misses and adaptation of systems to eradicate them is inconsistent across the enterprise. Within the research and teaching communities, less rigorous practitioners seem to accept different safety tolerances for different environments. Things happen in academic research labs that would never be allowed where I work. The path to failure illustrated by this colloquy should be obvious and unacceptable. Prudent Practices has been used worldwide and has served as a leading reference book for laboratory practice. The committee hopes that this new edition of the book will expand upon that tradition, and that this edition will assist the readers to provide a safe and healthy laboratory environment in which to teach, learn, and conduct research. Page x Share Cite Suggested Citation:

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Prudent Practices includes an expanded section on improving environmental health and safety performance by providing guidance on integrating environmental health and safety management within an overall laboratory management system to control health and safety risks in a systematic, proactive manner.

4: "Prudent Practices"™ is out, UCLA lab safety center established | The Safety Zone

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A key focus of Prudent Practices is the importance of establishing and nurturing a "culture of safety" – an environment in which safe laboratory practice is standard.

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