Appendix D: Particularly Hazardous Substances

The Occupational Safety and Health Administration's (OSHA) standard for Occupational Exposures to Hazardous Chemicals in Laboratories (see Appendix B for more details) requires that your laboratory's Chemical Hygiene Plan include provisions for additional employee protection for work with particularly hazardous substances. Particularly hazardous substances include select carcinogens, reproductive toxins, and substances that have a high degree of acute toxicity. These substances are described more fully in this appendix.

DEFINITIONS

OSHA provides the following definitions for each type of particularly hazardous substance.

"Reproductive toxins" means chemicals that affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

"Select carcinogen" means any substance that meets one of the following criteria:

(i) It is regulated by OSHA as a carcinogen; or

(ii) It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP)(latest edition); or

(iii) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for research on Cancer Monographs (IARC)(latest editions); or

(iv) It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:

(A) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m(3);

(B) After repeated skin application of less than 300 (mg/kg of body weight) per week; or

(C) After oral dosages of less than 50 mg/kg of body weight per day.

"High degree of acute toxicity" The OSHA Laboratory Standard does not list or define substances with a high degree of acute toxicity. The rule's preamble (55 FR 3320) describes substances with a high degree of acute toxicity as those substances that are "fatal or cause damage to target organs as a result of a single exposure or exposures of short duration." Hydrogen cyanide, hydrogen sulfide, and nitrogen dioxide are given as examples.

To determine if you use a substance with a high degree of acute toxicity that may require additional employee protection under the OSHA Laboratory Standard, consult your Safety Data Sheets, the Registry of Toxic Effects of Chemical Substances (RTECS), or contact Environmental Health and Safety. Part B of the Guide discusses the criteria for classifying acutely toxic chemicals.

SOURCES OF INFORMATION

The lists of different particularly hazardous substances are extensive, regularly updated, and available on the internet at each of the below listed sites. Theses sites all offer a search function that quickly locates health hazard information on a specific chemical. If the referenced web addresses changes you can complete a search for these sites using your current web browser, by typing in the title or acronym provided immediately prior to the site address.

OSHA Carcinogens: https://www.osha.gov/SLTC/carcinogens/standards.html

National Toxicology Program (NTP): **http://ntp-server.niehs.nih.gov/** (NTP homepage) or https://ntp.niehs.nih.gov/pubhealth/roc/index-1.html (Report on Carcinogens)

International Agency for Research on Cancer (IARC): **http://monographs.iarc.fr/** (IARC Homepage) or https://monographs.iarc.fr/wp-content/uploads/2018/09/ClassificationsAlphaOrder.pdf (Agents Classified by the *IARC Monographs*, Volumes 1–123)

Registry of Toxic Effects of Chemical Substances (RTECS):
https://www.cdc.gov/niosh/rtecs/default.html (RTECS Homepage) or
https://www.cdc.gov/niosh/rtecs/RTECSaccess.html (Accessing RTECS)

SUBSTANCES WITH A HIGH DEGREE OF ACUTE TOXICITY

The OSHA Laboratory Standard does not list or define substances with a high degree of acute toxicity. The rule's preamble (55 FR 3320) describes substances with a high degree of acute toxicity as those substances that are "fatal or cause damage to target organs as a result of a single exposure or exposures of short duration." Hydrogen cyanide, hydrogen sulfide and nitrogen dioxide are given as examples.

To determine if you use a substance with a high degree of acute toxicity that may require additional employee protection under the OSHA Laboratory Standard, consult the Safety Data Sheet for specific chemicals, the *Registry of Toxic Effects of Chemical Substances* (RTECS), or contact Environmental Health and Safety. Part B of the Guide discusses the criteria for classifying acutely toxic chemicals.