Chemical Fact Sheet

Cyanide Chemical Safety Fact Sheet

Potassium cyanide and sodium cyanide are most commonly used commercially for fumigation, electroplating, extracting gold and silver from ores, and inhibiting cellular respiration. Users of these chemicals must be aware that hydrogen cyanide gas can be released by sodium and potassium cyanide after undergoing hydrolysis. Hydrogen cyanide has a distinctive bitter almond odor and is a dangerous chemical asphyxiant that interferes with the body's ability to use oxygen. Exposure to cyanides can be rapidly fatal. These chemicals can cause systemic damage, particularly affecting those organ systems most sensitive to low oxygen levels such as the central nervous system (brain), the cardiovascular system (heart and blood vessels), and the pulmonary system (lungs).

Personnel working with cyanide compounds must perform all work in a chemical fume hood wearing personal protective equipment (PPE), including safety glasses, butyl rubber gloves and a laboratory coat. Before beginning work with these compounds, the users must also familiarize themselves with the laboratory area and the location of the nearest emergency drench showers and emergency eyewash. In addition, the user must have the antidote kit accessible during usage of cyanide compounds.

Training

Only individuals who have received proper training may use cyanide compounds at the Harvard Institutes of Medicine (HIM) and New Research Building (NRB). The training shall include reading this fact sheet, understanding the chemical's material safety data sheet (MSDS), and receiving appropriate instruction from the supervisor or principal investigator on laboratory procedures.

Exposure risks from Cyanides

- Cyanides are fast acting poisons that are highly toxic and can be lethal. Exposure to small amounts can be life threatening—refer to the MSDS.
- Because cyanides can be rapidly fatal, an antidote kit should be available. Talk with your institutions Occupational Health Department regarding antidote kits since a prescription is required when ordering this kit.

The Following Practices Must Be Followed Within Laboratories Using Cyanides

- Provide job-specific training to staff.
- Provide appropriate employee chemical hygiene plan (CHP) training for all work processes.
- Cyanide is highly toxic; exposure can be prevented by using a fume hood and by safe chemical handling.
- Work areas should be labeled "Cyanide Materials in Use."
- Cyanides must be stored and used away from acids in a cool, dry and secure location.
- Do not eat, drink, smoke, chew gum, apply cosmetics or lip balm in laboratories, ever.
- Cyanide compounds may only be used with another person present in the laboratory who is familiar with signs or symptoms of cyanide poisoning.
- Wear appropriate PPE (laboratory coat, butyl rubber gloves, safety glasses).
- Change disposable gloves frequently and wash hands after use.
- Cyanides need to be disposed of as hazardous waste because of toxicity. All materials contaminated with cyanides, including empty containers, must be disposed of as hazardous waste.
- Call 617-432-1901 immediately if there has been a chemical spill.

Occupational Exposure Limits

U.S. Occupational Safety and Health Administration (OSHA) 8-hour permissible exposure limit (PEL) time weighted average (TWA) (skin) for cyanide is 5 milligrams per cubic meter (mg/m^3). The skin notation indicates that cyanide may be absorbed through the skin, which typically provides a barrier for chemicals. The OSHA PEL for hydrogen cyanide is 10 milligrams per cubic meter. By handling cyanides safely, using a fume hood in addition to proper chemical handling techniques and the appropriate PPE, staff exposures can be prevented.

Also See:

- Potassium Cyanide or Sodium Cyanide MSDS
- HIM-NRB Chemical Hygiene Plan available on the HIM/NRB EH&S Webpage: http://www.himnrbehs.com/himnrbehs/chemicalSafety.asp

For more information contact the HIM/NRB EH&S Office, 617-432-2762