Use of Potassium or Sodium Cyanide is to be limited to applications for which no suitable substitute is available. The Yale University Office of Environmental Health and Safety should be notified of any purchase or use of these compounds and this written procedure should be reviewed prior to working with these cyanides.

Primary Hazards

Potassium and Sodium Cyanide are highly toxic compounds that may be ingested or absorbed through the skin. In reaction with acid or water they will produce hydrogen cyanide gas, a deadly compound when inhaled.

Storage

All containers of sodium or potassium cyanide are to be stored in locked cabinets. Keys to these cabinets should be accessible to only those persons familiar with these handling requirements. These compounds are to be stored in areas protected from possible contact with water or acid. All containers should be clearly labeled with the chemical name and marked as toxic.

A copy of this document should be kept at each storage site, along with a current inventory of these cyanides.

Handling

Potassium and sodium cyanide shall be dispensed and handled only in an operational fume hood, at least 6 inches behind the sash into the hood. No containers of acid should be in the hood or work area. A pH 10 buffer solution and dilute bleach solution should be available to clean up the surfaces after handling.

A dry chemical fire extinguisher should be available for use in the laboratory. A CO₂ extinguisher should not be used in the event of a fire involving cyanides.

Never work with cyanides while alone. Make sure that at least one other person is in the laboratory and knows that you are working with these compounds.

Work involving sodium or potassium cyanide should only be conducted during normal business hours, if possible. Emergency response is normally much quicker at these times.

Personal Protective Equipment

When working with cyanide and cyanide compounds inside a fume hood, wear a fully buttoned lab coat with tight-fitting cuffs or sleeve covers, double nitrile gloves (exam style worn under utility gloves), and eye protection. Always work with the sash between your face and the work area.

Decontamination of Work Area

Utensils, glassware, and other surfaces contaminated with cyanide compounds must be decontaminated at the end of the laboratory work session. This should be completed inside the fume hood before removing any of the items. All contaminated surfaces should be washed using
a pH 10 buffer solution and rinsed with a dilute bleach solution. The contaminated solutions should be collected as cyanide containing hazardous waste.

Waste

Cyanide waste solutions must be collected in a dedicated waste bottle in the cyanide work area hood. Never add any acidic compounds to this container. All gloves, matting, and any other potentially contaminated material must also be collected as hazardous waste. Label all cyanide waste containers listing all compounds present and approximate concentration of each, the pH, and the total waste volume. Keep all cyanide waste containers inside the fume hood.

Spill Response

If a spill is contained in the fume hood and involves less than approximately 1 gram of material, follow the decontamination procedure outlined above. Call EHS for assistance if needed or desired (785-3555).

For larger spills inside the fume hood, close the sash, cordon off the area, and call the EHS spill response team at 785-3555 for assistance. Stay in the area to provide information and assistance to the response team and to ensure that no one enters the area in the meantime.

Any size spill not contained in a fume hood should be considered a major spill. Evacuate the laboratory immediately and contact the EHS spill response team at 785-3555. Contact 911 and/or 911 if anyone exhibits symptoms of cyanide exposure.

Signs and Symptoms of Exposure to Cyanide

Many people, but not everyone, can detect a bitter almond odor when exposed to even low levels of hydrogen cyanide gas. Lack of a perceptible odor should not be construed as an absence of HCN.

Symptoms of exposure may include healthy pink to red skin color. If oxygen deficiency occurs, the skin color may be bluish. Reddening of the eyes, pupil dilation, nausea, breathing difficulty or dizziness may also be symptoms of cyanide exposure.

Medical Treatment

Call 911 immediately in the event of a cyanide exposure. Indicate in your call that the exposure involves cyanide. Be sure to indicate clearly your location to the dispatcher, including full building name and street address.

In the event of a dermal exposure get the victim to the nearest deluge shower and thoroughly flush with water for at least 15 minutes while removing contaminated clothing and shoes. Use of the lower water pressure from a sink faucet may spread the contamination while rinsing, and is therefore not recommended.

In the event of an inhalation exposure, remove the victim to fresh air while awaiting emergency responders. Do not give mouth-to-mouth resuscitation, as this may cause cyanide exposure to the rescuer.

Cyanide Antidote Kit

There is an antidote kit available for cyanide exposures. However, this kit is a prescription drug and use of the medications in this kit may cause serious adverse health effects. Some of the components of this kit must be administered by IV and should only be done by trained medical personnel. Removal from the exposure and treatment with oxygen until arrival at the hospital is
as effective in most instances as treatment using the medications in the cyanide antidote kit. Yale New Haven Hospital is prepared to medically treat cyanide exposures and all victims of potential cyanide exposure will be taken to Yale New Haven Hospital. It is recommended that you contact the Yale Employee Health Physician (2-0071) to discuss medical precautions and treatment options prior to working with cyanides.

**Chemical Safety Review Protocol**

Complete the information in the attached Chemical Safety Review Protocol and return it to EHS (fax: 5-7588) prior to working with sodium or potassium cyanide.

References:

Yale University Resources:

Office of Environmental Health and Safety  
Cathleen King  
Chemical Hygiene Officer  
785-5106  
785-3550 (front desk)

Dr. Dorothy van Rhijn  
Occupational Health Physician  
432-0071
RESEARCH PROTOCOL CHEMICAL SAFETY REVIEW

Date of Request: ________________________
Name_______________________________________________________________
Email address_________________________________________________________
Location (Building/Room)_______________________________________________
Department___________________________________________________________
Telephone_____________________________________________________________
Principal Investigator_____________________________________________________

SUBSTANCE TO BE USED

Name ___________________________________ CAS No. _____________________
Location of Use __________________________________________________________
Quantity Procured ________________________________________________________
Quantity/Concentration of Use ______________________________________________
Storage Location/Conditions ________________________________________________
Anticipated Start/End Dates _________________________________________________
Frequency of Use _________________________________________________________

PERSONNEL PROPOSED FOR THIS PROJECT

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

EXPERIMENTAL PROCEDURES
Briefly describe the procedures that will involve the use of this substance

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
RATIONALE FOR USE
Justify why safer chemical/procedure not used as substitute:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

CONTROL PROCEDURES
Describe controls that will be employed to protect the individuals participating in this research (ventilation, equipment, personal protective equipment, etc):
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

DECONTAMINATION AND DISPOSAL
Decontamination procedures to be used (surfaces, materials, instruments, equipment, etc.):
______________________________________________________________________________
______________________________________________________________________________
Disposal procedures (wastes and unused stock):
______________________________________________________________________________
______________________________________________________________________________

EMERGENCY PROCEDURES
Procedures to be used in the event of personnel exposure. Be specific to your location and situation (phone, eyewash/shower, exits, alarms, etc):
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Equipment to be used in the event of environmental decontamination (spill control equipment/procedures):
______________________________________________________________________________
______________________________________________________________________________

Completed form should be submitted to:
Yale University
Environmental Health and Safety
135 College Street, 1st floor
New Haven, CT 06510
Fax: 785-7588
RESEARCH PROTOCOL CHEMICAL SAFETY REVIEW

Cyanide Handling Procedure

Note: if you require assistance in completing this form, call the Office of Environmental Health and Safety at 785-3550

Date of Request: ________________________

Name_______________________________________________________________

Email address_________________________________________________________

Location (Building/Room)_______________________________________________

Department___________________________________________________________

Telephone_____________________________________________________________

Principal Investigator_____________________________________________________

SUBSTANCE TO BE USED

Name ___________________________________ CAS No. _____________________

Location of Use __________________________________________________________

Quantity Procured ________________________________________________________

Quantity/Concentration of Use ______________________________________________

Storage Location/Conditions ________________________________________________

Period (Dates) /Frequency of Use_____________________________________________

PERSONNEL PROPOSED FOR THIS PROJECT

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EXPERIMENTAL PROCEDURES

Briefly describe the procedures that will involve the use of this substance:

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________________________________________________________________________
CONTROL PROCEDURES
Describe controls that will be employed to protect the individuals participating in this research:
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DECONTAMINATION AND DISPOSAL
Decontamination procedures to be used (surfaces, materials, instruments, equipment, etc.):
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Disposal procedures (wastes and unused stock):
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EMERGENCY PROCEDURES
Procedures to be used in the event of personnel exposure (inhalation, eye/skin contact, ingestion, inoculation):
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______________________________________________________________________________
Equipment to be used in the event of environmental decontamination (spill control equipment/procedures):

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Completed form should be submitted to: Office of Environmental Health and Safety
135 College Street, 1st floor
New Haven, CT 06510