VANDERBILT UNIVERSITY

Principal Investigator: Date Approved:

This document covers basic chemical safety information for cyanide salts and supplements the laboratory Chemical Hygiene Plan as appropriate. The use of any cyanide salt is subject to pre-approval by the Principal Investigator (PI) and/or designated Laboratory Responsible Safety Person. DO NOT USE ANY CYANIDE SALT UNTIL YOU HAVE OBTAINED THE NECESSARY PRE-APPROVAL.

Cyanide Salts

Cyanide salts such as sodium, potassium, or copper cyanide are solids which convert rapidly to flammable hydrogen cyanide (HCN) gas when exposed to acid or moisture. Inhalation of hydrogen cyanide gas can be fatal.

Exposure to cyanide salts through ingestion, skin absorption, and inhalation of dust is acutely toxic. The cyanide ion interferes with electron transfer in cellular respiration, resulting in decreased oxygen uptake. Symptoms of acute cyanide poisoning include difficulty breathing, headaches, and confusion leading to unconsciousness. Metal hydroxides are also formed upon contact with moisture, often presenting a corrosion hazard that could cause damage to exposed tissues.

Personal Protective Equipment & Personnel Monitoring

Lab Coat

Traditional white lab coat, with a chemical-resistant lab apron when working with large quantities.

Gloves

Nitrile gloves.

Eye Protection

Face Shield

ANSI Z87.1-compliant safety goggles or face shield if a splash hazard is present.

Labeling & Storage

Cyanide salts should be stored upright & tightly closed in a cool, dry, and well-ventilated place away from other materials which are chemically incompatible. Cyanide salts are incompatible with acids and acid salts, strong oxidizers, and carbon dioxide. Contact with acid liberates toxic and flammable hydrogen cyanide gas. Containers must be stored below eye level. Each container's label must include a skull-and-crossbones pictogram, the word "Danger", and identify the material as acutely toxic. Containers of acute toxicants must be stored in leak-proof secondary containment within a Designated Area. The secondary container's label must include a skull-and-crossbones pictogram, the word "Danger", and identify the material as acutely toxic. Also, if not plainly visible (e.g., through a cabinet window), labelling must be applied to storage locations where these are stored to avoid an inadvertent encounter.

Engineering Controls, Equipment & Materials

Fume hood/ Biosafety Cabinet IIB2	Use fume a hood or hard-ducted Class II B2 biosafety cabinet (BSC). If your protocol does not permit the handling of such materials in a fume hood, contact the Department of Environmental Health, Safety and Sustainability (EHSS) to determine whether additional respiratory protection is warranted.

Housekeeping	
Spills	Notify others in the area of the spill, including your PI/Responsible Safety Person. If it is a small spill that you can easily handle, use the contents of your lab spill kit to clean it up. If it is a large spill, then evacuate the area where the spill occurred. Call Vanderbilt University Public Safety (VUPS) at 615-421-1911 or use the VandySafe app on your smart phone. Report any exposure through Risk and Insurance Management's Origami portal and mark that it occurred in research when prompted. Both VUPS and the Origami system will notify EHSS of the incident. Remain on site at a safe distance to provide detailed information to first responders.
Decontamination	Wearing proper PPE, wipe up any residue with absorbent pads and clean the area with soap and water. Dispose of the contaminated disposables as extremely hazardous waste.
Waste	Refer to the laboratory *Chemical Hygiene Plan* (Section 6.7) for information on proper chemical waste disposal procedures. Always keep cyanide waste at pH > 9. Please note that cyanide salts are considered 'extremely hazardous' when disposed of as waste.

First Aid & Emergencies	
Antidote Kit	If available, keeping a cyanide poison antidote kit close by during use of these substances is highly recommended. Contact EHSS for more details.
Skin Contact	Immediately remove contaminated clothing and shoes; Wash off with soap and plenty of water for 15 minutes. Get medical attention immediately.
Eye Contact	Immediately flush eyes with water for at least 15 minutes. Get medical attention immediately.
Inhalation	Move person into fresh air. If not breathing, give artificial respiration. Get medical attention immediately.
Ingestion	Never give anything by mouth to an unconscious person. Rinse mouth with water. Get medical attention immediately.

Name	Signature	Date