

**This Chemical Safety Protocol (CSP) covers basic chemical safety information for hydrazine and other corrosive and flammable particularly hazardous substances (PHS) and supplements the laboratory Chemical Hygiene Plan as appropriate. Additional lab-specific safety operating procedures for hydrazine and other corrosive and flammable particularly hazardous substances (PHS) may also be required. The use of hydrazine or any corrosive and flammable PHS is subject to pre-approval by the Principal Investigator (PI) and/or the designated Laboratory Responsible Safety Person. DO NOT USE HYDRAZINE AND OTHER CORROSIVE AND FLAMMABLE PARTICULARLY HAZARDOUS SUBSTANCES (PHS) UNTIL YOU HAVE OBTAINED THE NECESSARY PRE-APPROVAL AND TRAINING.**

## Hydrazine and Other Corrosive and Flammable PHS

**Hydrazine** is used for organic synthesis, oxygen scavenging, and rocket fuel. It is a dangerously unstable, toxic, carcinogenic, and corrosive compound when in anhydrous form. It is corrosive to glass and can detonate even in the absence of oxygen. Hydrazine hydrates (from 15 to 64 wt%) are considered less toxic and flammable and should be used instead of anhydrous hydrazine whenever possible. *If you plan to use anhydrous hydrazine you must consult with VEHS before proceeding.*

Carcinogens, reproductive toxicants, and substances with a high degree of acute toxicity are considered particularly hazardous substances (PHS). This SOP covers **anhydrous hydrazine** and other PHS that are also corrosive and flammable. This category includes the following chemicals: **methylhydrazine, 2-methylaziridine, acrolein, 3-buten-2-one (aka methyl vinyl ketone), (R)-(+)-3-butyne-2-ol, benzyl-2,3,4,5,6-d5 chloride**, and any other chemicals with a similar hazard profile.

**Corrosive and flammable PHS** cause destruction of exposed tissues, are defined by the National Fire Protection Agency (NFPA) as having a flashpoint below 100 °F (37.8 °C), can be fatal in small doses, have the potential to cause cancer as the result of prolonged exposure, cause mutations as the result of sub-lethal exposures, and have the potential to interfere with fertility, fetal development, and/or lactation as the result of prolonged exposures. **For more information** on each individual hazard type, please refer to the respective 'single hazard' CSP.



## Personal Protective Equipment & Personnel Monitoring



**Lab Coat**

Flame resistant lab coat and a chemical-resistant lab apron.



**Gloves**

Nitrile or chloroprene gloves to protect against splash contact. Use butyl rubber (Viton) when handling acrolein and methylhydrazine. Consult glove selection chart for heavy handling of corrosives.



**Eye Protection**

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



**Face Shield**

## Labeling & Storage

Store corrosive and flammable PHS away from other materials that are not particularly hazardous or which may be chemically incompatible within a flammable storage cabinet with self-closing hinges or in a refrigerator rated for flammable storage. Any container greater than 1 gallon (4L) in size should be stored in a flammable storage cabinet. Limit the amount of flammables allowed outside a flammable storage cabinet, safety can, or approved refrigerator. Containers holding corrosives 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 both acutely toxic and carcinogenic. Containers of corrosive and flammable PHS 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 both acutely toxic and carcinogenic. 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. Review the specific chemical safety data sheets (SDS) for incompatibilities and light, air, moisture, and heat sensitivity information.

### Engineering Controls, Equipment & Materials

#### Fume Hood

It is advisable to use a fume hood or glove box when working with materials which are toxic by inhalation. If your protocol does not permit the handling of such materials in a fume hood, contact the Office of Environment, Health, Safety, and Sustainability (EHSS) to determine whether additional respiratory protection is warranted.

### Cautions & Considerations

#### Static Electricity

Transfer flammable chemicals from glass containers to glassware or from glass container/glassware to plastic whenever possible. Transferring these types of chemicals between plastic containers or metal containers may lead to a fire hazard due to static electricity. Use bonding and grounding wires if plastic or metal containers must be used.

### Housekeeping

#### Releases

Immediately notify others in the area of the release and evacuate the location where the release occurred. Notify your PI / Responsible Safety Person and call 615-421-1911 or use the VandySafe app. 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 EHS of the incident. Remain on-site at a safe distance to provide detailed information to first responders.

#### Decontamination

Clean any work surfaces which may have come in contact with these substances with soap and water.

#### Waste

Refer to the laboratory *Chemical Hygiene Plan* (Section 6.7) for information on proper chemical waste disposal procedures.

### First Aid & Emergencies

#### Skin Contact

Immediately remove contaminated clothing and shoes; flush skin with water for at least 15 minutes. Get medical attention immediately.


