|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A picture containing shape  Description automatically generated**Icon  Description automatically generatedIcon  Description automatically generatedA picture containing shape  Description automatically generated**Duke OESO Guidelines for Safe Use of**  **A picture containing text, clipart  Description automatically generatedA picture containing text, clipart  Description automatically generatedToxic & Health Hazard Liquids**  ***Examples:*** *carbon tetrachloride, glutaraldehyde solution (complete p.2 for ≥10%);*  *also flammable: methanol, carbon disulfide, n-hexane, xylene* | | | | | | | | | | | |
| **Hazards** | | **Potential Hazards** | | * **Exposure** to toxic & health hazard liquids can occur through the **skin** (possibly after penetrating gloves), **inhalation** of vapors or aerosols, or by accidental ingestion or injection. * **Acutely toxic** liquids can cause **death** or systemic **toxicity**. * Exposure can also cause **health hazards** (such as **cancer**, **reproductive** effects, **mutations**, **respiratory or skin sensitization**, and **organ damage**) and/or **irritation** of the eyes, skin, or respiratory system. * Some liquids may also have **physical hazards** (not covered by these guidelines). * See Safety Data Sheet (SDS) for specific hazard information. * *Create a lab SOP with specific decontamination methods for* [*particularly hazardous*](https://www.safety.duke.edu/chemical-hygiene/particularly-hazardous-substances) *liquids.* | | | | | | | |
| **Hazard Controls** | | **Selection & Purchase** | | * Purchase the **smallest containers** at the **lowest concentration** practical. * Purchase in **shatter-resistant containers** if available (such as plastic or PVC-coated glass). * Purchase **gloves** not quickly penetrated by the liquid for cleaning up small spills. | | | | | | | |
| **Storage & Transport** | | * 03-439, 03-439AStore **below eye level** but **not on the floor**, in a cabinet or on a shelf in a well-ventilated room. **Do not** store in cold rooms. * **Keep toxic liquids away from incompatible materials** (see SDS for specifics).   + Organic materials away from oxidizers. * See other [guidelines](https://www.safety.duke.edu/chemical-hygiene/chemical-sops) for storage of flammbles, oxidizers, or corrosives. * **Transport** toxic and health hazard liquids in a **bottle carrier**. | | | | | | | |
| **Engineering Controls** | | * Usea **chemical fume hood** with [particularly hazardous](https://www.safety.duke.edu/chemical-hygiene/particularly-hazardous-substances) and other odorous or volatile hazardous liquids when: | | | | | | A picture containing shape  Description automatically generatedIcon  Description automatically generatedChemical Fume Hood Flow Diagram | |
| * + **Heating** the liquid AND/OR | | | * + Working with **open** containers | | |
| * Check with OESO to determine if small quantities or dilute solutions of toxic or health hazard liquids can be handled safely on the benchtop. | | | | | |
| **Work Practice Controls** | | * **Designate a specific work area** for [particularly hazardous](https://www.safety.duke.edu/chemical-hygiene/particularly-hazardous-substances) liquids and label it. * **Line work area** with absorbent, leak-proof bench pads. * Use in the **smallest practical quantities** for work being done. * Plan work to **avoid contact with gloves\***. *Change gloves immediately if contaminated.* * **Change gloves\* at least every 2 hours** and **wash hands** at time of glove change. * **Decontaminate** work area with an appropriate solvent or a solution of detergent and water. | | | | | | | |
| **Personal Protective Equipment**  **(PPE)** | | **Minimum PPE:**   * Nitrile gloves\* * Safety glasses * Fastened lab coat | | lab coat2nitrile glovesImage result for safety glasses | | | **If “fatal in contact with skin”:** 2 pairs nitrile gloves or better\* | | |
| nitrile glovesnitrile gloves3XE79_AS01?$zmmain$8400131-24A close-up of a shoe  Description automatically generated with medium confidence**Risk of splash/large amounts,** ADD:   * Goggles (and consider a face shield) * Impervious sleeves and apron (or coverall) | | | | | | | |
| *\*Check the manufacturer’s glove guide or SDS for glove breakthrough time.* | | | | | | | |
| **Other**  03-8-2023. Online with links at <https://www.safety.duke.edu/chemical-hygiene/chemical-sops>. | | **Emergencies** | | See Emergency Response [webpage](https://www.safety.duke.edu/emergency), Flip Chart, and/or lab specific chemical hygiene plan. | | | | | | | |
| **Waste** | | See lab-specific chemical hygiene plan, [Lab Chemical Waste Management Practice](https://www.safety.duke.edu/sites/default/files/Lab-Waste-Management-Practice.pdf), and [Drain Disposal Practice](https://www.safety.duke.edu/sites/default/files/Drain-Disposal-Practice.pdf). | | | | | | | |
| **Training** | | Sign signature page in lab-specific chemical hygiene plan to indicate review. | | | | | | | |
| **Questions** | | Contact OESO Laboratory Safety at 919-684-8822 or [labsafety@duke.edu](mailto:labsafety@duke.edu). | | | | | | | |
|  | | | **Lab-Specific Safety Information for**  **Toxic & Health Hazard LIQUIDS**  ***Supplements the Guidelines for Safe Use of Toxic & Health Hazard Liquids*** | | | | | | | |  | |
| **Lab** | **PI Name** | | Click or tap here to enter PI Name | | | | | | | | | |
| **Location** | | Enter building(s) and room(s) where lab is located | | | | | | | | | |
| **Notes for using this Guideline: ONLY** for use with chemicals that meet ALL of the following criteria:   * Action B or C (NOT Action A) as determined by the [GHS Lookup Tool](https://www.safety.duke.edu/sites/default/files/GHS_Lookup.xlsm) or [Action Matrix](https://www.safety.duke.edu/sites/default/files/GHS_Action_Matrix.pdf) & SDS for your product. * ONLY have HEALTH hazards in any of these classifications: acutely toxic (inhalation, dermal, and/or oral), carcinogens, mutagens, reproductive hazards, respiratory/skin sensitizers, irritants, corrosive to skin/eyes, and/or specific target organ toxicity.   If the chemical is [flammable](https://www.safety.duke.edu/sites/default/files/GuidelinesFlammableLiquids.pdf), [corrosive](https://www.safety.duke.edu/sites/default/files/GuidelinesCorrosives.pdf), and/or an [oxidizer](https://www.safety.duke.edu/sites/default/files/GuidelinesOxidizers.pdf), attach the appropriate guideline(s) to this completed toxic liquids guideline.  If the chemical has **other physical hazards** (reacts violently with water, contact with acid forms toxic gas, etc.) in addition to the health hazards, you must use this [OESO SOP template](https://www.safety.duke.edu/sites/default/files/SOP_Template.docx) to create a separate lab-specific SOP.  For **Action A chemicals**, use this [OESO SOP template](https://www.safety.duke.edu/sites/default/files/SOP_Template.docx) to create a lab-specific SOP – it must be approved by the PI and, in many cases, by OESO. | | | | | | | | | | | | |
| **Lab-Specific Hazard Controls** | **Chemical Information** | | Chemical Name | | **Chemical 1**  Enter Chemical Name | | | **Chemical 2**  Enter Chemical Name | **Chemical 3**  Enter Chemical Name | | | |
| CAS Number | | Enter CAS Number | | | Enter CAS Number | Enter CAS Number | | | |
| GHS Hazard Classes and Categories  *(If flammable, corrosive, or an oxidizer, check the appropriate box(es) at right and refer to the relevant guideline(s) as well.)* | | Enter All GHS Hazard Classes and their Category (e.g. Carcinogenicity, Category 1A)  Particularly Hazardous  [Flammable Guideline](https://www.safety.duke.edu/sites/default/files/GuidelinesFlammableLiquids.pdf)  [Corrosive Guideline](https://www.safety.duke.edu/sites/default/files/GuidelinesCorrosives.pdf)  [Oxidizer Guideline](https://www.safety.duke.edu/sites/default/files/GuidelinesOxidizers.pdf) | | | Enter All GHS Hazard Classes and their Category (e.g. Carcinogenicity, Category 1A)  Particularly Hazardous  [Flammable Guideline](https://www.safety.duke.edu/sites/default/files/GuidelinesFlammableLiquids.pdf)  [Corrosive Guideline](https://www.safety.duke.edu/sites/default/files/GuidelinesCorrosives.pdf)  [Oxidizer Guideline](https://www.safety.duke.edu/sites/default/files/GuidelinesOxidizers.pdf) | Enter All GHS Hazard Classes and their Category (e.g. Carcinogenicity, Category 1A)  Particularly Hazardous  [Flammable Guideline](https://www.safety.duke.edu/sites/default/files/GuidelinesFlammableLiquids.pdf)  [Corrosive Guideline](https://www.safety.duke.edu/sites/default/files/GuidelinesCorrosives.pdf)  [Oxidizer Guideline](https://www.safety.duke.edu/sites/default/files/GuidelinesOxidizers.pdf) | | | |
| **Purchase**  **Details** | | Maximum container size | | Enter maximum container size purchased | | | Enter maximum container size purchased | Enter maximum container size purchased | | | |
| Container type | | Enter the container material | | | Enter the container material | Enter the container material | | | |
| Specific product information | | Enter supplier name/product number or purity/grade to purchase | | | Enter supplier name/product number or purity/grade to purchase | Enter supplier name/product number or purity/grade to purchase | | | |
| **Storage** | | Specific location | | Enter specific storage location | | | Enter specific storage location | Enter specific storage location | | | |
| Special storage requirements | | Enter any special storage requirements | | | Enter any special storage requirements | Enter any special storage requirements | | | |
| **Use Information** | | Designated work area *(specific room(s) and area(s)) if particularly hazardous*  **LABEL WORK AREA** | | Enter rooms, fume hoods, BSCs, or other areas designated for use | | | Enter rooms, fume hoods, BSCs, or other areas designated for use | Enter rooms, fume hoods, BSCs, or other areas designated for use | | | |
| Maximum quantity | | Enter maximum quantity to be used at a time | | | Enter maximum quantity to be used at a time | Enter maximum quantity to be used at a time | | | |
| Typical concentration used | | Enter typical concentration used | | | Enter typical concentration used | Enter typical concentration used | | | |
| Specific Glove Information  **USE APPROPRIATE GLOVES**  **\*check SDS or glove guide** | | **1** pair of 4 mil **Nitrile** gloves  **2** pairs of 4 mil **Nitrile** gloves  **1** pair of **Neoprene** gloves  Specify type(s) of gloves if not nitrile or neoprene | | | **1** pair of 4 mil **Nitrile** gloves  **2** pairs of 4 mil **Nitrile** gloves  **1** pair of **Neoprene** gloves  Specify type(s) of gloves if not nitrile or neoprene | **1** pair of 4 mil **Nitrile** gloves  **2** pairs of 4 mil **Nitrile** gloves  **1** pair of **Neoprene** gloves  Specify type(s) of gloves if not nitrile or neoprene | | | |
| Other Required PPE | | Standard Lab Coat  Chemical Splash Goggles  Other PPE Needed | | | Standard Lab Coat  Chemical Splash Goggles  Other PPE Needed | Standard Lab Coat  Chemical Splash Goggles  Other PPE Needed | | | |
| PPE Storage Location | | Specific PPE storage location | | | Specific PPE storage location | Specific PPE storage location | | | |
| Work Area Decontamination  *(must be completed for Particularly Hazardous chemicals)* | | Work area decontamination supply type and location. Include any special PPE needed. | | | Work area decontamination supply type and location. Include any special PPE needed. | Work area decontamination supply type and location. Include any special PPE needed. | | | |
| Location & type of spill clean-up supplies  *(including glove type needed for spills)* | | Spill supply type and location. | | | Spill supply type and location. | Spill supply type and location. | | | |
| **Waste Disposal** | | Chemical Waste Information | | Enter location of waste container, type of container used. | | | Enter location of waste container, type of container used. | Enter location of waste container, type of container used. | | | |
| **Details of Process for Chemical 1** | | 1. Click or tap here to enter details specific to your lab’s process with Chemical 1. | | | | | | | | | |
|  | **Details of Process for Chemical 2** | | 1. Click or tap here to enter details specific to your lab’s process with Chemical 2. | | | | | | | | | |
|  | **Details of Process for Chemical 3** | | 1. Click or tap here to enter details specific to your lab’s process with Chemical 3. | | | | | | | | | |