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| **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.*
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| **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.
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| **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**.
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| **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
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| * Check with OESO to determine if small quantities or dilute solutions of toxic or health hazard liquids can be handled safely on the benchtop.
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| **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.
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| **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.  |
|   | **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** | [x]  **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  | [x]  **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 | [x]  **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 | [x]  Standard Lab Coat[x]  Chemical Splash Goggles[ ]  Other PPE Needed | [x]  Standard Lab Coat[x]  Chemical Splash Goggles[ ]  Other PPE Needed | [x]  Standard Lab Coat[x]  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.
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