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| **Duke OESO Guidelines for Safe Use of**  **Nitric Acid**  ***Complete Lab-Specific Safety Information on page 2*** | | | | |
| **Hazards** | **Potential Hazards** | * **Very strong oxidizer**: can ignite or react explosively with both organics and inorganics. * Concentrated nitric acid **can release vapors and toxic gases** (including NO2) * **Corrosive**. Burns skin, eyes, mucosal membranes, and respiratory tract. * OSHA Permissible Exposure Limit (PEL) is 2 ppm over 8 hours. * For more information, see the SDS and the [Lab Chemical Safety Summary for Nitric Acid](https://pubchem.ncbi.nlm.nih.gov/compound/944#datasheet=lcss&section=Top). | | |
| **Hazard Controls** | **Selection & Purchase** | * Purchase the smallest, shatter-resistant containers at **the lowest concentration practical (less than 70% if possible).** * Consider alternate methods and **use a less dangerous acid if possible**. * Buy inert absorbent or spill pads that can be used to absorb small spills of nitric acid. | | |
| **Storage & Transport** | * 03-439, 03-439AStore in **secondary containment** in a **well ventilated area.** * **Store away from incompatibles** such as organics and   combustibles as well as bases, reducing agents, and others.   * **Transport in secondary containment**, preferably a   polyethylene or other non-reactive acid/solvent bottle carrier.   * Store **below eye level** but **not on the floor**. * Store **away from metal** and **do not** store under the sink. | | |
| **Engineering Controls** | * **Eyewash** and **safety shower** are **required** in **immediate work area.** * Work in a **clean** **chemical fume hood** that is **free of organics and other incompatibles**. * Keep the **sash lowered** while reactions are in progress. | Safety Shower, Shower, Douche, Help**Eye Shower, Eye Wash, Rinse Eyes, First Aid, Sign**Chemical Fume Hood Flow Diagram | |
| **Work Practice Controls** | * Work should be done in a way that **avoids hand/glove contact** with nitric acid. * **When diluting, add acid to water slowly**, in small amounts. (Never add water to acid!) * **Decontaminate work area** by wiping it down with a soap and water solution. | | |
| **Personal Protective Equipment**  **(PPE)** | * Wear **closed-toed shoes** and **clothing covering the legs**. * **Minimum PPE:**   + Buttoned lab coat   + Safety goggles   + 5 mil NEOPRENE gloves (Change immediately if splashed) * Note that nitric acid **penetrates** lab **nitrile gloves in <5** **minutes.** Lab neoprene (5 mil) gloves last 10–30 minutes. | | lab coat23XE79_AS01?$zmmain$https://encrypted-tbn3.gstatic.com/shopping?q=tbn:ANd9GcScaXxU7EZ4PiTEXNR-iX_eIpqkjaiMUb3FPl611az7a271BgkS2-svSi99qenAu4M4cFK-z24&usqp=CAEAnsell Disposable Glove: Neoprene, M Size, 5.1 mil Glove Material Thickness, 9 1/2 in Glove Lg, Textured, Green, 100 PK |
| * 8400131-24**Risk of splash/work with >100 ml** add: face shield, impervious apron & sleeves   (or coverall), and gloves rated for nitric acid (e.g., 16–18 mil neoprene gloves).   * **Wash hands** at time of glove change. | | |
| **Other** | **Emergencies** | * See Emergency Response [webpage](https://www.safety.duke.edu/emergency) or flip chart and/or lab specific chemical hygiene plan. * For clean-up of *small* spills (<100 ml), neutralize with sodium carbonate from edge to center, then absorb with **inert** material. * Do not use combustible materials such as saw dust to absorb nitric acid spills! | | |
| **Waste** | See lab-specific chemical hygiene plan, [Lab Chemical Waste Management Practice](https://www.safety.duke.edu/environmental-programs/hazardous-waste/chemical-waste), and [Drain Disposal Practice](https://www.safety.duke.edu/environmental-programs/hazardous-waste/chemical-waste). **DO NOT MIX nitric acid waste with incompatible wastes (e.g., organics)!!!** | | |
| **Training** | Sign signature page in lab-specific chemical hygiene plan to indicate review. | | |
| **Questions** | Contact OESO Lab Safety at 919-684-8822 or [labsafety@dm.duke.edu](mailto:labsafety@dm.duke.edu) | | |

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|  | | **Lab-Specific Safety Information for**  **Nitric Acid**  ***Supplements the Guidelines for Safe Use of Nitric Acid*** | | |  | |
| **Lab** | **PI Name** | Click or tap here to enter PI Name | | | | |
| **Location** | Enter building(s) and room(s) where lab is located | | | | |
| **Lab-Specific Hazard Controls** | **Purchase**  **Details** | Maximum container size | Enter maximum container size purchased | | | |
| Maximum  concentration | Enter maximum concentration purchased | | | **Order 70% or lower when possible** |
| Container type | Enter the container material | **Purchase in PVC coated or HDPE “poly” bottle if possible** | | |
| Specific product information | Enter supplier name/product number or purity/grade to purchase | | | |
| **Storage** | Specific location | Enter rooms and areas designated for storage | | | |
| **Use Information** | Designated work area  (specific room(s) and area(s)) | Enter rooms and areas designated for use | | | |
| Maximum quantity | Enter maximum quantity to be used at a time | | | |
| PPE Storage Location | Enter location where specific PPE is stored (e.g. neoprene gloves, sleeves, apron, etc.) | | | |
| Location of supplies for  spill clean-up | Enter location of spill supplies (sodium carbonate and inert absorbent) | | | |
| **Waste Information** | Details about waste (location, type of container) | Enter location of waste container, type of container used | | **DO NOT mix**  **with organic waste!** | |
| **Details of Process** | 1. Enter steps used in lab process(es) or experiment(s) | | | | |