PURPOSE

*Describe relevant background information.*

Nitric acid is an inorganic compound with the formula HNO3. It is highly corrosive and colorless, however, due to decomposition into oxides of nitrogen, samples tend to acquire a yellow cast. Most commercially available nitric acid is at a concentration of 68% HNO3 in water. Fuming nitric acid refers to solutions with more than 86% HNO3. Depending on the amount of nitrogen dioxide present, it can be further characterized as red fuming nitric acid or white fuming acid at concentrations above 95%.

Nitric acid is the primary reagent used for nitration, the addition of a nitro group, typically to an organic molecule. Nitric acid is also commonly used as a strong oxidizing agent.

[Note The following processes listed below utilize nitric acid. Please be sure to complete this SOP and reference the specific process.]

* Acid Bath for Glassware Cleaning
* Sample Digestion for Atomic Absorption Analysis
* Purification of Carbon Nanotubes

Scope

*Identify the intended audience and/or activities where the SOP may be relevant.*

This SOP is intended for lab personnel involved in the usage of nitric acid on UF campus.

[Please add or remove additional scope information as needed]

Responsibilities

*Identify the personnel that have a primary role in the SOP and describe how their responsibilities relate to this SOP.*

* [Identify personnel & responsibilities here.]

Hazard Identification & Control Measures

*Include information on how to handle a particularly hazardous substance or experimentation using a certain piece of equipment. Instructions might include recommended hazard control measures, PPE, chemical transportation, and storage. Describe transport, receiving, and storage requirements. Include secondary containment, transport devices (carts, carriers, etc.), segregation requirements, any special temperature or atmospheric requirements, and container compatibility requirements.*

**A. Potential Hazards**

* **Chemical Hazards (CH):** Oxidizing, corrosion to metals
* **Biological Hazards (BH):** Corrosive to skin, acute toxicity
* **Physical Hazards (PH):** None
* **Electrical Hazard (EH):** None
* **Other Hazards:** None

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[Please add or remove potential hazards as needed]

**B. Engineering Controls / Administrative Controls**

Perform all operations in a certified chemical fume hood, wet bench, or other approved ventilated enclosure.

[Please add or remove engineering and/or administrative controls as needed]

**C. Personal Protective Equipment (PPE)**

Eye protection: safety glasses or google, lab coat, gloves: Ansell neoprene for handling concentrated acid, Ansell nitrile for solutions < 20% nitric

[Please add or remove additional PPE requirements as needed]

Procedure

*Provide the steps required to perform this procedure (who, what, when, where, why, how).*

[Please describe your step-by-step process]

Special Handling and Storage Requirements

*List applicable precautions for preparation and storage.*

Store nitric acid in an acid cabinet near the fume hood. Keep the container tightly closed in a dry and well-ventilated area, away from direct sunlight. Nitric acid must be stored below eye level.

Opened containers must be carefully resealed and stored upright to prevent leakage. Always store nitric acid in secondary containment.

Store nitric acid away from flammable and combustible materials. Incompatibles include reducing agents, bases, alkali metals, cyanides, powdered metals, and organic materials (including organic acids). It’s advisable to further segregate nitric acid from other inorganic acids.

Waste Disposal Procedures

*List the types of waste (solid or liquid), the expected amount of waste generated, and how the waste should be handled when performing the procedure. Also list the hazard determination (flammable, oxidizer, corrosive, reactive, toxic) of the generated waste.*

* **Solid Waste:** None
* **Liquid Waste:** Toxic and corrosive

**Disposal procedure and location of Satellite Accumulation Area:**

[Please indicate the location of the satellite accumulation area]

Nitric acid waste should never be combined with organics or reducing agents. The best practice is to store all nitric acid-containing waste streams in a dedicated container segregated from all other waste streams if possible.

* Containers must always be closed except when physically adding waste.
* Containers must be labelled with all chemical constituents (and their approximate % by volume), including water.
* Segregate liquid waste from solid wastes.
* Use secondary containment (tray or tub).
* Leave adequate headspace in liquid containers (~1” is sufficient for a 4L container; leave space depending on the size of your waste container).

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Emergency Response (Spill & Accident Procedures)

*Indicate how spills, personnel exposure/injury, and other accidents should be handled and by whom. List the physical address on campus.*

**Exposure:**

* Skin or Eye Contact: Remove contaminated clothing and accessories; flush affected area with water for 15 minutes. Get medical attention.
* Inhalation: Move affected person into fresh air. Get medical attention.
* Ingestion: Rinse mouth with water. Get medical attention.

**Life-threatening emergencies** (fire, explosion, large-scale spill or release, compressed)

* **ACTIVATE THE BUILDING’S FIRE ALARM SYSTEM IF THE SPILL REPRESENTS A**

**THREAT TO HUMAN LIFE OR MAY CAUSE A FIRE OR EXPLOSION.**

* Notify all personnel in the workspace that a spill has occurred and evacuate all personnel from the workspace to a safe location.
* Isolate the workspace to prevent inadvertent entry: lock any access doors, place signs on doors reading “DO NOT ENTER-CHEMICAL SPILL”
* **Call EHS at 352-392-8400 for clean-up assistance. If the emergency occurs outside of normal work hours, contact the University Police Department at 392-1111.**

**For small spills/local clean-up** (< 50 mL concentrated, < 500 mL diluted)

In the event of a minor spill or release that can be cleaned up by local personnel:

1. Notify personnel in the area and restrict access.

2. If trained and confident, apply acid neutralizer wearing PPE described above

including face shield. Otherwise contact EHS at (352) 392-8400.

3. Absorb with polypropylene, vermiculite, or pearlite absorbent after neutralization.

The spill kit is located under the sink.

4. Collect spill cleanup materials in a closed container. Manage spill clean-up debris as

hazardous waste.

5. Submit online waste pickup.

**Emergency Contact Numbers:**

* Principal Investigator: [xxx-xxx-xxxx]
* Building Manager: [xxx-xxx-xxxx]
* Lab Manager: [xxx-xxx-xxxx]
* Poison Control Center: 800-222-1222
* Emergency: 911
* EH&S: 352-392-1591

**Physical Address on Campus:**

[Add your lab’s address here]

References

*List resources that may be useful when performing the procedure, for example, Admin policies, standards, etc.*

[Add references & resources here]

Documents and attachments

*List applicable forms that are required to be completed in the SOP. Attach any documents used in support of the SOP, e.g., flowcharts, work instructions, pictures or diagrams, forms, and labels.*

[List applicable forms and attachments here]