

**Standard Operating Procedure for Using Acids\*
in the PI Name Lab (Bldg#, Room#)**

\****Does not apply to hydrofluoric, perchloric or picric acids***

Print a copy and keep with your lab’s training documents.

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| Department |  |
| Principal Investigator (PI) |  |
| PI Phone # |  |
| Secondary Contact |  |
| Secondary Contact Phone # |  |
| Emergency/24-Hour Contact |  |
| Emergency Contact Phone # |  |

1. **Purpose**

The purpose of this document is to provide the information necessary to safely use most acids (nitric, hydrochloric, phosphoric, acetic, sulfuric) in the PI Name Laboratory and to comply with requirements of OSHA Standard 29 CFR 1910 Subpart Z.

1. **Hazard Identification**



* *Corrosive* – ALL acids are corrosive to the eyes, skin, and mucous membranes. Acute (short-term) inhalation exposure may cause eye, nose, and respiratory tract irritation and inflammation and pulmonary edema in humans.  Acute oral exposure may cause corrosion of the mucous membranes, esophagus, and stomach and dermal contact may produce severe burns, ulceration, and scarring in humans.  Chronic (long-term) occupational exposure to hydrochloric acid has been reported to cause gastritis, chronic bronchitis, dermatitis, and photosensitization in workers.  Prolonged exposure to low concentrations may also cause dental discoloration and erosion.
* *Strong oxidizing agent* – (NITRIC acid only) is an extremely corrosive acid and strong oxidizing agent. It may be harmful if ingested, inhaled, or absorbed through the skin. It can cause severe skin and eye burns resulting in irreversible damage. It is extremely destructive to the tissue of the mucous membranes and the upper respiratory tract. As a strong oxidizing agent, it can cause violent explosions when combined with reducing agents.
* *Highly Reactive –* (NITRIC acid only) is a strong oxidizing agent, it can cause violent explosions when combined with reducing agents such as organic solvents and reagents. *Therefore, great care must be taken to store it separately from organic acids, flammable and combustible liquids (such as organic solvents), and organic reagents in general.*  Nitric acid waste must also be segregated from all other organic waste. *Mixing of nitric acid waste with incompatible waste streams is a major cause of laboratory incidents.*
* *Combustible/Flammable –* Some acids (acetic, glacial acetic, formic) are somewhat flammable and should be stored separately from nitric acid and away from sources of extreme heat or open flames. Storage within a separate spill tray in a flammables cabinet is acceptable.
1. **Training Requirements**

All UNM personnel who use acids must be trained before using them. Training must include:

* This SOP (read and sign)
1. **Engineering & Administrative Controls**

All acids must be handled/used within a chemical fume hood, which is designed to pull air and fumes up and away from the user (Engineering Control).

All lab personnel who use acids must be trained on the hazards of acids, including being familiar with this SOP (Administrative Control).

1. **Personal Protective Equipment (PPE)**
* *Hand Protection*: Nitrile gloves are adequate protection. Proper glove removal technique is imperative (i.e. remove without touching glove’s outer surface).
* *Eye Protection*: Safety glasses or splash goggles must be worn when handling acids.
* *Skin and Body Protection*: A lab coat or protective apron must be worn when handling acids.
* *Respiratory Protection*: Acids must only be used in a properly operating chemical fume hood. Do not open, pour, etc. acids anywhere other than within a chemical fume hood.
1. **Standard Operating Procedures for Handling and Storing Acids:**

Acids must be only used in areas equipped with a functioning eye wash/safety shower that can be reached within ten seconds. It is essential that all strong oxidizers (such as nitric acid) be stored separately from other chemicals with which they may react. For oxidizing acids such as nitric acid, this includes all organic materials. Ensure secondary containment (spill trays) and segregation of incompatible chemicals. Also, follow any substance-specific storage guidance provided in Safety Data Sheet (SDS) documentation.

The corrosive properties of acids and the ability of certain acids (such as nitric) to produce fires or explosions when combined with combustible materials make the following considerations mandatory in the selection of a storage site:

* 1. A relatively cool, dry environment free from extremes of temperature.
	2. Store in a material that is acid-resistant; this facilitates flushing and other cleanup procedures in the event of leaks or spills.
	3. Store on low shelves or in “Corrosives” storage cabinets.
	4. Segregate nitric acid from organic acids (lactic, acetic, formic, citric) and all flammable liquids. **This is crucial to avoid fires/explosions.**
	5. Segregate all acids from active metals such as sodium, potassium, magnesium, etc.
	6. Use bottle carriers for transporting materials when possible.
	7. When mixing acids and water, always add acid to water. To avoid surface boiling/spattering, **NEVER add water to acid**.
	8. Store mineral acids (hydrochloric, sulfuric, phosphoric, boric) together, separate from oxidizing agents and organic materials.
	9. As they deem necessary, the PI/supervisor should insert here any information about whether a special use-area is designated for this material/process.
	10. Add appropriate lab-specific information here describing how this material(s) is generally used. E.g., name of protocol, typical frequency done, quantities used, temperature and any additional safety measures, etc.
1. **Chemical Decontamination & Disposal**

Using proper personal protective equipment as outlined above, decontaminate equipment and bench tops using soap and water and properly dispose of all chemical and contaminated disposables as hazardous waste following the guidelines below.

All chemical waste must be disposed of in accordance with Federal and State regulations and UNM's Chemical Hygiene Plan. Nitric acid and nitric acid-containing wastes should be collected in suitable containers and properly labeled as soon as waste is added to the containers. Acid waste should be labeled as such:

**HAZARDOUS WASTE**

**Acid waste (be specific)**

**Corrosive & Reactive**

\* **It is crucial to avoid mixing nitric acid waste with organic waste of any kind. Nitric acid waste containers should be clearly marked as such to avoid accidental addition of any reducible materials. Failure to do this may cause a violent reaction.**

Call EHS at 505-277-2753 to schedule a pickup of acid and/or other waste chemicals.

1. **Spill Procedures:**

For small/minor spills (<1L), use the materials in the spill kit to clean up the spill. Minimum PPE for cleaning up a spill of acid is safety glasses/goggles, gloves and lab coat. The spill clean-up materials must be double-bagged, tightly closed, labeled and picked up by EH&S for disposal.

Spills in excess of 1L of acid should not be cleaned up by lab personnel. In the event of a large/major spill of acid, evacuate the area and call:

* Campus Police -- 911 on a landline or 505-277-2241 on a mobile phone, and
* Environmental Health & Safety (EH&S) – 505-277-2753 during business hours, or
* EH&S Duty Officer Pager -- 505-951-0194 (enter your phone number after the message)
1. **First Aid Procedures**

In the event of an overexposure to acid, seek immediate medical attention.

* Skin Contact and Eye Contact should be washed immediately in safety shower or eyewash for 15 minutes.
* If the exposure is severe, seek medical attention at the emergency room. If heading to UNMH, a non-injured person should contact the UNMH charge nurse in advance at 505-604-9349 with information on the chemical and nature of exposure.
* UNM employees should contact Employee Occupational Health Services (EOHS) at 505-272-8034.
* UNM students should contact Student Health Services at 505-277-7810.
* If the exposure occurs after hours, employees and students should seek medical treatment at a hospital emergency room.
* The supervisor of the injured person and EH&S must be notified as soon as possible after the exposure.
* The notice of Accident, Incident, or Spill form should be filled out on the EH&S website.

1. **Other Emergencies**

**Fire or Medical Emergency -- Dial 911**

**Life-Threatening Emergency, After Hours, Weekends and Holidays** – **Dial 911**

**Non-Life Threatening Emergency** – Call EH&S at 505-277-2753 to seek assistance and report the incident.

**Principal Investigator/Lab Manager SOP Approval**

By signing and dating here, the Principal Investigator/Lab Manager certifies that this Standard Operating Procedure (SOP) for Using Acids is accurate and provides information sufficient to safely use acids in the Tamarind Institute.

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Signature Printed Name/Title Date

I have read and understand the content of this SOP:

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| **Name** | **Signature** | **Date** |
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