

	Safe Use of Nitric Acid	Effective	January 25, 2006
		Originator	D. Taddeo
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		Updated By:	D. Taddeo

1. POLICY:

The purpose of this policy is to guide all users in the safe use of Nitric Acid.

2. SCOPE:

This policy applies to all faculty, staff and students of Ross University School of Veterinary Medicine that are involved in the use of nitric acid.

3. PROCEDURE:

Nitric acid is a strong acid and a strong oxidizer. As such, it contributes oxygen to reactions that may include flammable or combustible materials. Seventy percent nitric acid is commercially available as concentrated nitric acid. Concentrations above 90% nitric acid are called fuming nitric acid. On contact with air, fuming nitric acid gives off white or red fumes that are extremely toxic, corrosive, and reactive with combustible materials.

Safety Tips To Keep In Mind:

- Nitric acid reacts vigorously and violently with the following.
 - **Combustibles:** e.g. glacial acetic acid, diesel
 - **Flammables** (including flammable organic solvents): e.g. acetone, ether, and toluene
 - **Bases:** e.g. ammonium hydroxide, potassium hydroxide, sodium hydroxide
 - **Reducing Agents:** e.g. metal hydrides, ammonia, and phosphorus
 - **Metals:** e.g. lead, zinc (galvanized steel), aluminum
 - **Metal Compounds:** e.g. nitric acid used to etch, alloys

Do not allow nitric acid to come in contact with these materials! Reaction products of nitric acid with organic chemicals or ammonia may also be explosive.

- When using high concentrations of nitric acid, work should be done in a fume hood equipped with a water wash down system. Clear the hood of flammable materials and make sure the hood ductwork is not “ganged” to other hoods where organic solvents or ammonia might be used.
- Gloves (butyl rubber or neoprene), splash goggles, a face shield and an impervious apron should be worn when handling high concentrations of nitric acid. Vapors, fumes and liquid nitric acid can severely burn the eyes and skin. Nitric acid vapors and fumes are irritating to the respiratory system. Inhalation of

high concentrations of nitric acid vapor should be reported immediately. Delaying treatment can result in lung edema and death.

- When diluting nitric acid, add the acid to water, **slowly**.
- Review SafetyWeb “Alternatives to Chromic/Sulfuric Acid for Cleaning Laboratory Glassware” for substitutes for concentrated nitric acid to clean glassware.
- Store nitric acid in the original container. Dilute solutions must be stored in acid-resistant bottles. Do not store nitric acid near materials with which it might react. As much as possible, store nitric acid in its own storage cabinet near floor level. If a dedicated storage cabinet is not available, store nitric acid with inorganic acids, segregated from the other acids in secondary containment (a plastic bin or tote works very well).
- Nitric acid spills can be extremely dangerous. If less than 1ml of concentrated acid or 100ml of dilute acid is spilled, the spill can be neutralized by adding soda ash or sodium bicarbonate and rinsing with copious quantities of water. If the spill is large (greater than 1 liter of concentrated acid or more than you have materials to handle), evacuate the laboratory, close the doors, and call security