GUIDELINES FOR THE SAFE USE OF NITRIC ACID

Nitric Acid (**HNO3)** is a clear, colorless to slightly yellow inorganic acid. In concentrations above 70%, nitric acid is called "fuming" or "red fuming." The material is not combustible, however it is a strong oxidizer and care should be taken in storing it away from incompatibles (see below). Spontaneous ignition or combustion takes place when a substance reaches its ignition temperature without the application of external heat.[1] Materials susceptible to spontaneous combustion due to contact with nitric acid include oily rags, dust accumulations, and many organic materials. Routes of entry to the body include inhalation and ingestion. Skin contact results in severe irritation and burns. Nitric acid is not listed as a carcinogen.

Health Hazards

1. Symptoms of overexposure include irritation and/or burning of the affected area.
2. Inhalation burns are serious and require immediate medical attention.
3. Ingestion causes abdominal pain, vomiting, hemorrhaging, and organ perforation. If the acid is ingested, drink copious amounts of water and seek medical attention. Do not induce vomiting.
4. If acid is spilled onto the body, wash the acid off with generous amounts of water for 15 min.
5. Spills which occur over a large body surface require the use of the nearest emergency shower and removal of contaminated clothing.
6. Eye wash locations should be easily accessible in case of eye contact. Flush eyes for a minimum of 15 minutes and notify the Campus Police and the EH&S office immediately.

Safety Precautions for Nitric Acid Use

1. All University of Pittsburgh staff, students and employees who work in labs containing nitric acid should familiarize themselves with the unique dangers and special precautions that need to be taken when handling nitric acid.
2. Incompatibles include flammables, bases, hydrogen sulfide, organic materials, metals and metal compounds.
3. Work with nitric acid should always be performed in a chemical fume hood. Care should be taken to clear the hood of organics, flammables, and other incompatibles.
4. Personal protective equipment including the appropriate gloves, safety glasses, and lab coat or apron must be worn.
5. OSHA Permissible Expose Limit (PEL)- 2 ppm
6. Immediately Dangerous to Life and Health (IDLH)- At levels greater than or equal to 25ppm

Storage, Spills and Waste Issues

1. As a result of its wide range of incompatible chemicals, nitric acid is difficult to keep safely in storage. Ideally, nitric acid should be stored in its own acid cabinet. However due to space considerations this is not always possible. The next best place for storage is with other inorganic acids and within secondary containment.
2. Nitric acid spills are serious and care should be taken to follow all chemical spill clean up procedures.
3. Small or dilute concentrations (10 ml of >50% or 100 ml of dilute) can be cleaned up using a spill kit. The entire spill kit containing the clean up materials can then be labeled and placed in a satellite accumulation area for pickup and disposal.
4. If large amounts of acid are spilled, or if the spill is beyond your ability and training to clean up, evacuate the laboratory and contact EH&S or the University Police from a safe location.
5. Never pour waste nitric acid into a sink or sewer drain.

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[1] Committee on Hazardous Substances in the Laboratory, Assembly of Mathematical and Physical Sciences, National Research Council. *Prudent Practices for Handling Hazardous Chemicals in Laboratories.*1981. pp. 59.