

Laboratory Fact Sheet: Guidelines for Work with Picric Acid

Scope: Picric acid (also known as trinitrophenol; CAS# 88-89-1) is a pale yellow, odorless crystal that is slightly soluble in water and highly sensitive to heat, shock, or friction. It is commonly used as a staining agent and reagent in many laboratory procedures. Picric acid is known for its unstable nature and ability to react with other materials and create explosive compounds. Please note: we encourage use of safer alternatives when available and feasible (premixed stains). Please visit: <http://www.ehs.ucsb.edu/units/labsfty/labrsc/factsheets/picricacid.pdf> for further information.

Chemical/Toxicological properties: In dry form, picric acid is an explosive compound. It easily forms picrate salts that are often more unstable and explosive than pure picric acid. These picrate salts are formed when in contact with concrete, amines, bases and metals (copper, lead, mercury, and zinc).

Health Hazards: Picric acid is a strong irritant and allergen that causes local, as well as systemic allergic reactions. Picric acid can cause skin damage and staining at the contact site as well as systemic poisoning when ingested or absorbed. Symptoms include headache, nausea, vomiting, diarrhea, abdominal pain, itching, urinary dysfunction, stupor, convulsions, and even death. Hepatic and renal damage may also occur.

Signs & Symptoms of Exposure:

Local: Picric acid dust or solutions are potent skin sensitizers. In a solid form, it is a skin irritant. Skin usually turns yellow upon contact, and areas around the nose and mouth as well as the hair are often affected. Corneal injury may occur from exposure to picric acid dust or solution.

Systemic: Inhalation of high concentrations of picric acid dust can cause temporary coma followed by weakness, myalgia, anuria (absence of urine production), and polyuria (excessive urination). High doses may cause destruction of erythrocytes, nephritis (inflammation of kidney) and hepatitis.

First Aid: If chemical gets into eyes, flush with copious amounts of water for at least 15 minutes. If picric acid comes in contact with skin, promptly wash area with soap and water. If large amounts are inhaled, move exposed person to fresh air immediately and perform artificial respiration. If large amounts are swallowed, get immediate medical attention.

Reference: “Guidelines for Safe Use and Management of Picric Acid”, Texas A&M University, Environmental Health & Safety Department.
http://tees.tamu.edu/EPjsp/f_dwn.jsp?image_num=0D8B6920636F61DE1D4AC503787566
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Personal Protective Equipment: Skin protection with a lab coat or protective disposable gown can prevent the irritant and sensitizing action of picric acid. Wear eye protection and/or face shield to prevent possible eye contact. Employees should wash promptly when skin is wet or contaminated. Work clothing should be changed daily if working with picric acid on a consistent basis. Wear appropriate protective gloves of compatible material(s). Butyl and Viton gloves are suggested when working with picric acid.

Storage Requirements:

- Picric acid and its derivatives should be stored in small quantities in the original container in a cool, dry, well-ventilated area, away from sources of heat.
- Picric acid is considered a flammable solid and is **incompatible** with oxidizers, reducing agents, inorganic salts, metals, alkaloids and albumin.
- Improper storage of picric acid may become sensitive to shock, friction, and heat. Picric acid, if dried out to less than 10% water by volume, becomes very unstable and may pose an explosion hazard in the laboratory.
- Date all bottles of picric acid with “Date Received” and “Date Opened”.
- Keep only small amounts of picric acid. **Dispose every 2 years.**

Disposal Procedures: If an old or previously unaccounted bottle of picric acid is found, the following steps should be taken:

- Most importantly **DO NOT TOUCH THE CONTAINER!!** Crystals may have formed between the lid and the container. Any attempt to open the container could result in an explosion.
- Visually inspect the contents of the bottle to determine water content and check for signs of crystallization inside the bottle and around the lid.
- If there is the slightest indication of crystallization or low levels of water in the bottle please contact Environmental Health & Safety at 210-567-2955 immediately for assistance.

- Properly secure the container by lightly “misting” any attainable crystals (such as those that may have formed on the outside of the bottle) with large quantities of water.

Safe Handling Procedures:

- All work with picric acid should be performed in a chemical fume hood to minimize inhalation exposure.
- Remember, picric acid should never be allowed to dry out.
- Check receipt date: If the date is greater than 2 years, call EH&S for immediate disposal.
- Do not assume that all laboratory personnel know the hazards and risks regarding the use of picric acid.
- Maintain a log for weekly inspection of containers, use, and receipt/opened activities. (See example of log sheets at end of this document)
- Logs should be posted near the picric acid storage area for easy access.
- Re-hydrate as needed to maintain a wet paste. The recommended water content should be at least 10% water by volume.
- Do not use metal spatulas when removing or weighing material.
- Clean bottleneck, cap and threads with a wet cloth before re-sealing.
- Dispose of all bottles with metal caps.
- If exposed through skin contact, use the nearest eyewash/shower and immediately begin flushing with water for at least 15 minutes.
- Remove all contaminated clothing.

Emergency & Spill Response:

- Stop or reduce the spill if it is safe to do so.
- Do not allow spilled material to dry- dampen spilled solids with water without stirring. **DO NOT** attempt to sweep up dry material. Picric acid must remain wet to reduce the hazard of cleanup.
- Contain spill with material that does not react with spilled chemical- use a spill response pad or diaper pad damp with water to absorb spilled material.

- Contaminated absorbent material may pose the same hazard as the spilled hazard.
- Contact Environmental Health & Safety at (210)567-2955 and request an immediate pick-up of the containers of spilled product and contaminated absorbent material.

Accidental Exposures:

Skin Contact: Immediately proceed to the nearest eyewash/shower and rinse the affected area thoroughly with water for at least 20-30 minutes. Remove all contaminated clothing while continuing to flush with water. If irritation persists, repeat flushing. **DO NOT INTERRUPT FLUSHING.**

Eye Contact: Immediately proceed to the nearest eyewash station and flush the contaminated eye(s) with lukewarm, gently flowing water for at least 20-30 minutes. Hold eyelids open and away from the eye during irrigation to allow for thorough flushing.

Ingestion: Have the victim rinse mouth thoroughly with water. Do not induce vomiting. Have victim drink 240 to 300 ml (8 to 10 oz.) of water to dilute material in the stomach. If milk is available it may be administered after the water has been given.

Training: Any lab personnel using Picric Acid needs proper training on use, storage, spill/exposure procedures and have proper documentation. Please use our Site Specific Chemical Hazard training form to complete the necessary training. You can obtain this form by clicking on the link provided: <http://research.uthscsa.edu/safety/specifichazchemicaltrngform.pdf>

Seek medical attention. Provide a copy of MSDS. Contact UT Medicine (210-450-9100) Primary Care Clinic during normal business hours, or University Hospital Emergency Triage (210-358-2488) after normal business hours or on weekends.

For questions or concerns, please contact:

**Environmental Health & Safety, 1.343T DTL
(210)567-2955**

<http://research.uthscsa.edu/safety>

