Picric Acid

Standard Operating Procedure

Revision Date: 12/20/23

Laboratory Director (LD) Approval is Required Prior to Performing this Procedure

This standard operating procedure (SOP) outlines the handling and use of picric acid. Review this document and supply the information required in order to make it specific to your laboratory. In accordance with this document, laboratories should use appropriate controls, personal protective equipment, and disposal techniques when handling picric acid. All laboratory workers must read and understand the [*Laboratory Emergencies SOP*](https://ehs.umich.edu/wp-content/uploads/2022/05/LaboratoryEmergencyProceduresSOP.docx) prior to commencing any work in a laboratory.

# Description [Provide additional information as it pertains to your research protocol]

Picric acid is an organic compound and is a high-powered explosive when allowed to dehydrate. Picric acid, when in contact with metals, can form shock sensitive metal picrates. Picric acid can be detonated by extreme heat, a blasting cap, or an electric charge.

## Process [Write the steps for using the chemical in your research protocol]

# Potential Hazards [Provide additional information as it pertains to your research protocol]

* The most serious hazard associated with this chemical is the risk of explosion, which is severe if the acid is dry.
* Toxic if swallowed, inhaled or absorbed through the skin. Inhalation of dust may cause lung damage. Chronic exposure may cause liver or kidney damage. It is a skin irritant and allergen.
* Refer to the safety data sheet (SDS) for additional signs/symptoms/health effects.

# Engineering Controls [Provide additional information as it pertains to your research protocol]

Use picric acid in a lab fume hood to reduce risk of inhalation.

# Work Practice Controls [Provide additional information as it pertains to your research protocol]

* Do not use metal spatulas to remove picric acid.
* Clean the bottleneck, cap and threads with a wet cloth before resealing.
* If handling picric acid contained in a jar, gently tilt bottle to see if crystals roll over each other. If they do, the acid is dry and capable of explosion. Dried crystals may also be present within threads of screw top containers and present a detonation hazard when opening container.
* If acid appears dry or crystallization occurs, do not open or handle the container. Contact Environment, Health & Safety- Hazardous Materials Management (EHS-HMM) at (734) 763-4568 immediately.

# Personal Protective Equipment [Provide additional information as it pertains to your research protocol]

Wear lab coat with fully extended sleeves, safety glasses or splash goggles, nitrile or neoprene or other picric acid-resistant gloves (latex is not effective), pants, and closed-toe shoes. Other PPE may also be required such as a face shield, apron, etc.

# Transportation and Storage [Provide additional information as it pertains to your research protocol]

* Label containers with date received and date opened. Dispose after 2 years of storage.
* Store in original container in a cool, dry, well-ventilated area away from sources of heat.
* **Keep wet** – material should be a wet paste and **greater than 10% water by volume**.
* Check for evidence of dried crystals (see work practice control section) and rehydrate contents every 6 months with DI water as needed and document on bottle.
* Store separately from oxidizers, reducing agents, inorganic salts, metals (copper, lead, zinc, aluminum), ammonia, concrete, plaster, salts, gelatin, alkaloids and albumin.

# Waste Disposal [Provide additional information as it pertains to your research protocol]

## Old or Previously Unaccounted for Bottles of Picric Acid

Potentially, old picric acid is an item of special concern and garners considerable attention. If old or previously unaccounted for bottles of picric acid are discovered, the following steps should be taken:

* Most importantly, **DO NOT TOUCH THE CONTAINER!** Depending on how long the bottle has been left and the state of the product inside, even a minor disturbance could be dangerous. Crystals may have formed between the lid and the container. Any attempt to open the container could result in an explosion large enough to do serious damage to personnel and equipment.
* Visually inspect the container for product identification and check for an expiration date. If the product is relatively new, there may not be a problem. Nevertheless, treat the situation carefully.
* 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 no evidence of crystal formation and the water content is fairly high, there is probably little cause for concern. If there is even the slightest indication of crystallization or low levels of water in the bottle, the situation is more serious. Contact EHS-HMM at (734) 763-4568 immediately for guidance! Immediately secure the area and restrict access. A measure of security can be obtained by lightly misting any attainable crystals (such as those that may have formed on the outside of the bottle) with large quantities of water. A water spray bottle is ideal for this purpose.
* Dry picric acid or picrate salts should not be touched or moved under any circumstances. This is a serious potential hazard.
* If you feel that your laboratory may have old picric acid in your chemical inventory, contact EHS-HMM at (734) 763-4568 for a special pick-up to have it removed, but do not handle it yourself.

Because most spent, unused, and expired chemicals/materials are considered hazardous wastes, they must be properly disposed of. **Do not dispose of chemical wastes by dumping them down a sink, flushing in a toilet or discarding in regular trash containers, unless authorized by EHS Hazardous Materials Management (HMM)**. Contact EHS-HMM at (734) 763-4568 for waste containers, labels, manifests, waste collection and for any questions regarding proper waste disposal. Also, refer to the EHS [Hazardous Waste](http://ehs.umich.edu/haz-waste/) Web page for more information.

# Training of Personnel

All personnel are required to complete the ***General Laboratory Safety Training*** session (**BLS025w** *or equivalent*) via the [EHS My LINC](https://ehs.umich.edu/safety-training/) Web page.

Furthermore, all personnel shall read and fully adhere to this SOP.

# Certification

I have read and understand the above SOP. I have received approval from my Lab Director to perform this procedure. I agree to contact my Lab Director if I plan to modify this procedure.

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### Major Revisions (Tracking purposes only -- Do not print as part of SOP)

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| Date | Revision |
| 09-19-18 | Updated EHS name and logo and format and revised the Exposure/unintended contact section (AKJ) |
| 02-25-19 | Updated links and certification (DML) |
| 12-22-22 | Updated emergency info and links (BR) |
| 12-20-23 | Reviewed content and updated links. (BR) |