

Chemical Risk Management Protocol

Safe Methods of Use (SMOU)

Picric acid (2,4,6, Trinitrophenol)

Table of Contents

1	Purpose	3
2	Picric Acid.....	3
3	Storage.....	3
4	Use	3
5	Disposal	4
6	Emergency	4
6.1	Dry Picric Acid	4
6.2	Spills.....	4
7	References	5

1 Purpose

This Safe Method of Use applies to principal investigators (PIs), laboratory managers, designated laboratory person (DLPs), and all staff and students who direct or participate in the use of picric acid at the University of Auckland.

Note: the word 'shall' denotes a mandatory requirement and the word 'should' denotes a recommendation.

2 Picric Acid

Picric acid (Trinitrophenol) is normally stored in a desensitised state with at least 30% (w/w) water or ethanol.

In dry form picric acid is a shock-sensitive high explosive! It has a detonation velocity of 7350 m/sec (TNT has a detonation velocity of 7300 m/sec).

Picric acid can form extremely shock sensitive picrates with metals and concrete (calcium picrate is friction sensitive). It is imperative that any spill on metal or concrete not be allowed to dry. Any container of picric acid with a metal lid shall be disposed of immediately by qualified personnel.

3 Storage

Storage of picric acid in the University of Auckland shall be restricted to approved storage areas where experienced staff will regularly inspect containers to ensure water levels are maintained.

Picric acid shall be stored away from sources of heat or sparks or any other source of ignition.

Picric acid shall be stored in a cool well-ventilated area where water levels are easily and readily checked. The picrates are sensitive to heat, friction or impact. Inspect and add water every six months as needed and rotate containers to distribute water every three months.

Picric acid containers shall be clearly and indelibly labelled.

4 Use

Picric acid shall never be allowed to reach a dry state. Keep wetted with water at all times 30% (w/w).

Do not attempt to weigh wet powder or use metal spatulas. Dispense as a saturated solution (saturated solution contains 1g picric acid per 78mls water).

Dilute any spills immediately and do not allow picric acid solution to dry on the threads of screw caps. Some crystals may be on the threads and the friction of removing cap might detonate the container. Under these circumstances, the container may be safe enough to place in a pail of water. Submerge the bottle to allow water to enter the cap and threads.

Picric acid is toxic and shall not be allowed to become in contact with skin. Picric acid shall be handled with appropriate gloves, preferably double gloves. Use nitrile gloves with 0.11 mm thickness. The short-term exposure limit (STEL) for picric acid is 0.2mg/m³.

If possible, eliminate it from your inventory by purchasing premixed stains or a 1% solution for using stain preparation.

5 Disposal

Picric acid must be properly disposed of through specialized suppliers, as long as the chemical is hydrated, and no crystal formation is evident. If the picric acid is dry and/or crystal formation is evident, call the Hazards and Containment Manager immediately to arrange for disposal.

6 Emergency

6.1 Dry Picric Acid

If a container of picric acid that is dry and/or has crystal formation is found, immediately contact the Hazard and Containment Manager.

DO NOT move containers of dry picric acid.

Under no circumstances should the container of dry picric be opened. Dry picric acid in screw threads may detonate.

Remove all ignition sources, do not touch or walk-through spilled material

6.2 Spills

Most spills of picric acid can be handled safely following routine precautions. Wear appropriate PPE (lab coat, safety glasses, and gloves with adequate chemical resistance preferably nitrile). For spills it is recommended that you double-glove. Isolate the spill to prevent spread and avoid walking through the material and

spreading the contamination. Be careful not to cut yourself on any broken glass. For picric acid solutions: cover the spill area with a suitable absorbent material in case of small spills.

7 References

- Safe Handling of Picric Acid Document Number: CHM-GUI-006. University of Wisconsin-Madison
- SDS Picric Acid