

SAFE USE AND MANAGEMENT OF PICRIC ACID SafetyNet #104

Picric acid is used as a staining agent and reagent in many laboratory procedures. Although commonly treated as an acidic material, the real hazards of picric acid are its unstable nature and ability to react with other materials and create explosive compounds.

Chemical Properties¹

Picric acid is an odorless yellow crystal with an intense bitter taste. In dry form it is explosive compound. It easily forms picrate salts that are often more unstable and explosive than pure picric acid. These unstable picrate salts are formed when in contact with concrete, amines, bases, and metals (copper, lead, mercury, and zinc). Mixtures with aluminum and water may also ignite.

Toxicological Properties^{1,2}

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

The OSHA Permissible Exposure limit and the ACGIH Threshold Limit Value (TLV) for picric acid is 0.1 mg/m³. The oral rat LD₅₀ is 200 mg/kg.

Proper Storage

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. Improperly managed or stored picric acid may become sensitive to shock, friction, and heat. Picric acid allowed to dry out to less than 10% water by volume becomes unstable and may pose an explosion hazard in your laboratory. **If the material appears dry, do not open or handle the container.** Contact EH&S for assistance. The following steps can be taken to reduce the chances of this occurring in your laboratory:

1. Attach a copy of the "Picric Acid Inspection Log" (included below) to your picric acid container and write the date of initial receipt.
2. After initially opening the container, inspect the material monthly to ensure that it contains enough water. The material should look like a wet paste. Document this inspection on the "Picric Acid Inspection Log" in the inspection column.
3. Rehydrate the contents of the container every 6 months with deionized water to maintain a wet paste. Document this rehydration on the "Picric Acid Inspection Log" in the rehydration column.
4. Dispose of picric acid as a hazardous waste within two years of initial receipt.

