



Principal Investigator: \_\_\_\_\_

Date Approved: \_\_\_\_\_

**This document covers basic chemical safety information for perchloric acid. DO NOT USE PERCHLORIC ACID UNTIL YOU HAVE OBTAINED THE NECESSARY APPROVAL.**

## Perchloric Acid

Refer to the University of Arkansas Chemical Hygiene Plan for a description of chemicals that may be considered as a Particularly Hazardous Substance (PHS).

Perchloric acid is a clear, odorless liquid with the chemical formula  $\text{HClO}_4$ . It is a very strong acid and powerful oxidizer. Aqueous solutions up to 70% behave as strong, non-oxidizing acids at room temperature. When heated or at higher concentrations perchloric acid is a potent oxidizing agent which can form explosive salts with nearby organic, inorganic, and metallic substances. These salts are shock sensitive and pose a risk of fire and/or violent explosion.



## Exposure, Signs and Symptoms and Chemical Properties

Review the appropriate sections of the chemical specific Safety Data Sheet (SDS) for information on ways to detect exposure, appropriate exposure limits, signs and symptoms of exposures and chemical properties. If data is lacking in any area, refer to the following sites for additional information:

<https://pubchem.ncbi.nlm.nih.gov/>

<https://druginfo.nlm.nih.gov/drugportal/>

<https://toxnet.nlm.nih.gov/index.html>

<http://web.doh.state.nj.us/rtkhsfs/indexfs.aspx>

Always use the smallest amount of chemical that is consistent with the requirements of the work performed. Understand the chemical properties and what are the likely routes of exposure based on those properties and the procedures to be performed. Use containment devices (e.g., fume hood, glove box) when substance can volatilize, when the substance is manipulated, whenever aerosols or particulates may be produced, or when an action may result in an uncontrolled release.

Contact Environmental Health and Safety (EHS) if there are any questions (479-575-5448).

## Personal Protective Equipment (PPE) & Personnel Monitoring



**Lab Coat**

Traditional lab coat.



**Gloves**

Nitrile or neoprene gloves when handling small quantities. Use thicker polyvinyl chloride (Vinyl) gloves for larger volumes.



**Eye Protection**



**Face Shield**

ANSI Z87.1-compliant safety goggles, or face shield if a splash hazard is present. Consider using a blast shield for extra protection.

## Labeling & Storage

Store in secondary containment in a cool, dry, well-ventilated area away from metals and combustible materials. Do not store with hygroscopic chemicals (concentrated sulfuric acid, anhydrous phosphorous pentoxide, etc.). Avoid storage on wood floors or in wooden cabinets. Keep away from organic acids, all bases, and all organic material. Shelves and floor material should be non-combustible and acid-resistant. Protect from freezing. Also, if not plainly visible (e.g. through a cabinet window), labelling must be applied to storage locations where perchloric acid is kept to avoid an inadvertent encounter.

## Engineering Controls, Equipment & Materials

### Fume Hood

Any procedure involving heating of perchloric acid must be conducted in a fume hood with a built-in wash-down system. Perchloric acid vapors have the potential to condense and crystallize in the fume hood exhaust system. Crystallized perchloric acid is unstable and vibration in the duct and exhaust fans may result in an explosion. Fume hoods with a wash-down system flush away crystals deposited in the ductwork.

Do not store organic materials in the fume hood where perchloric acid is used. If your protocol does not permit the handling of perchloric acid in a fume hood, contact EH&S to determine whether additional respiratory protection is warranted.

## Housekeeping

### Spills

For very small spills, follow decontamination procedures using appropriate PPE; otherwise notify others in the area (to include the supervisor) of the spill and evacuate. Call 911 and report any exposure to EHS (479-575-5448). Remain on-site (at a safe distance) to provide detailed information to first responders.

### Decontamination

Do not allow the acid to dry. As appropriate, neutralize the acid with sodium bicarbonate and clean contaminated surfaces with soap and water. Absorb spill using an absorbent, noncombustible material such as earth, sand, or vermiculite. Do not use rags, paper towels or sawdust to soak up. Double bag spill waste in clear plastic bags, label and place in a flammable waste disposal container and contact EHS (479-575-5448) immediately.

### Waste

Perchloric acid should not be mixed with any other type of waste. Refer to the UA Chemical Hygiene Plan for additional disposal information and contact EHS (479-575-5448) for specific disposal instructions.

