

Perchloric Acid

Work with perchloric acid requires special care. The Iowa State University Laboratory Safety Manual has prescriptive requirements for work with chemicals.

KNOW THE HAZARDS OF THE MATERIALS YOU ARE USING.

All research activities at Ames Laboratory require approval by the Safety Review Committee. The procedure used for this approval is **READINESS REVIEW**. Make sure the activity you are working on has been approved via the Readiness Review procedure and that you are authorized to be performing work. Ask your supervisor.

Here are some general recommendations for working with perchloric acid

Personal Protection

- **Eye Protection:** Splash-proof safety goggles.
- **Gloves:** Polyvinyl chloride (PVC)
- **Ventilation:** Use in a hood with at least 100 fpm face velocity. In addition, the hood shall be dedicated to, and equipped for, perchloric acid use unless work has been approved by ESH&A.
- **Respirator:** Contact ESH&A regarding respiratory protection needs.

- **Clothing:** Lab coat and impervious apron if significant splash potential exists.

First Aid

Wash any exposed areas of skin with large volumes of water.

If eye contact has been made, flush eyes in eye wash for 15 minutes.

Notify your supervisor, ESH&A and/or Occupational Medicine (294-2056) if an exposure has occurred.

Handling Precautions

- **Eye Protection:** Approved safety goggles or glasses with side shields. Use the smallest amount of reagent possible to complete the experiment.
- Commercially available perchloric acid is usually 67% or 72%. At these concentrations, the acid is stable.
- Accidental formation of anhydrous perchloric acid is possible through evaporation or dehydration of the acid. In this form, **THE ACID IS EXPLOSIVE!!**
- Reduction of organic material should first be done with nitric acid followed by a mixture of nitric and perchloric acid.

Avoid contact of perchloric acid with the following chemicals:

- *Sulfuric Acid
- *Phosphorous Pentoxide
- *Alcohol
- *Glycerol
- *Hypophosphites
- *Acetic Anhydride
- *Bismuth and its Alloys
- *Combustible Materials like Paper and Wood

Storage/Disposal

- Store perchloric acid under fire resistant conditions in a metal cabinet.
- Do not store perchloric acid with organic materials.
- Stored perchloric acid should be inspected monthly for discoloration. If the acid is discolored, contact ESH&A for removal.
- Perchloric acid solutions are **CORROSIVE** and need to be disposed of using the *Hazardous Waste Disposal Procedure*.
- If perchloric acid has been used to oxidize organic material, the waste is also **REACTIVE**. Additional

precautions are necessary for disposal of this material.

- Contact ESH&A at 4-2153 for pick-up of waste perchloric acid solutions.

Spill Remediation

Dilute spills to prevent the formation of anhydrous perchloric acid. Use an inert, inorganic absorbent to soak up spills of perchloric acid.

Contact ESH&A, 4-2153, for assistance in spill remediation.

Notify your supervisor of any spill that has occurred.

Physical Properties

CAS#:	7601-90-3
Formula:	HClO ₄
Color:	Water white liquid fuming, oily liquid
Odor:	None
Boiling Point	203° C
Density	1.664, 70% solution



At **normal temperatures**, perchloric acid acts as a **non-oxidizing** acid.



At **elevated temperatures**, perchloric acid acts as an **oxidizing** acid.

Shipping Description

Concentrations > 72% are forbidden for transport.

Concentrations 50-72%:
UN1873, Perchloric Acid, 5.1, PGI,

Concentrations < 50%
UN1802, Perchloric Acid, 8, PGII

References

Everett, K. And Graf, F.A. Jr., **Handling Perchloric Acid And Perchlorates**, in Handbook of Laboratory Safety, 2nd Ed., Steere, N.V., Ed., CRC Press, Boca Raton, FL 1971, p. 265.

Schilt, A. A., Perchloric Acid And Perchlorates, G. Frederick Smith Chemical Co., 1979.

Merck Index, 11th ed., Abstract 7110

DISCLAIMER: This information is not intended to replace the Material Safety Data Sheet (MSDS). Always have access to a current MSDS for each chemical. It is the responsibility of the chemical user to be aware of the associated hazards.

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