



Laboratory Safety Fact Sheet: Perchloric Acid Fume Hood Use

The fact sheet below gives information on the importance of perchloric acid fume hood use.

What is Perchloric Acid?

Perchloric acid (HClO_4) is a strong acid and powerful oxidizer. At higher concentrations (> 70%) or when heated, it can form highly reactive and explosive compounds, especially when in contact with organic materials or metal residues.

Hazards

Explosion & Fire

- Forms shock-sensitive, explosive perchlorate salts in ducts and surfaces
- Reacts violently with organic materials, metals, and reducing agents

Corrosivity

- Causes severe burns to skin and eyes
- Highly damaging to mucous membranes

Toxic Vapors

- Vapors are corrosive and harmful if inhaled

Why Are Special Fume Hoods Required?

Perchloric acid must ONLY be used in a designed perchloric acid fume hood.

These hoods are specifically designed with:

- Wash-down systems to prevent buildup of explosive residues
- Non-sparking materials (e.g. stainless-steel ductwork)
- Dedicated exhaust systems

Do NOT use perchloric acid in standard chemicals fume hoods.

Before Using Perchloric Acid

- Complete specialized training and SOP review
- Verify you are using a certified perchloric acid fume hood
- Confirm wash-down system is operational
- Inspect hood for cleanliness (no residue buildup)
- Remove all organic materials and combustibles from hood
- Ensure inorganic acid spill kit is available

Required PPE

- Lab coat + acid-resistant apron
- Chemical splash goggles and face shield
- Acid-resistant gloves (e.g. neoprene, butyl)

Safe Work Practices

- Perform all work at least 6 inches inside the hood
- Keep sash as low as possible (below face level)
- Never place your head inside the hood
- Use small quantities only
- Avoid heating perchloric acid
- Never allow perchloric acid to contact:
 - o Organic materials (paper, solvents)
 - o Wood or cloth
 - o Metals that can form salts

After Use

- Activate wash-down system immediately after use
- Flush hood interior, ductwork, and exhaust system thoroughly
- Remove all residues from surfaces

Emergency Response

Spill

1. Call Georgia Tech PD @ 404-894-2500 and/or EHS @ 404-216-5237
2. Evacuate area immediately for large spills
3. Do NOT use organic absorbents (e.g. paper towels)
4. Use inorganic spill materials only

Exposure

1. Call Georgia Tech PD @ 404-894-2500 and/or EHS @ 404-216-5237
2. Skin/Eye contact: Flush with water (>15 minutes), seek medical attention.
Inhalation: move to fresh air
3. Seek immediate emergency medical care

Fire or Explosion Risk

1. Activate fire alarm and evacuate
2. Do not attempt to extinguish unless trained

Contact EHS:

For spills, exposure or questions:

EHS Emergency Number: 404-216-5237

Email: lab-chemsafety@gatech.edu