**Standard Operating Procedures**

Laboratory Specific

**Chemical:** **Hydrochloric Acid**

Please fill out the form completely.  Print a copy and insert into your

 *Laboratory Safety Manual and Chemical Hygiene Plan*.

Refer to instructions for assistance.

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Department:\_­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_                     Date when SOP was written: \_\_\_\_\_\_\_\_\_

Date when SOP was approved by the lab supervisor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

Internal Laboratory Safety Coordinator/Lab Manager: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Laboratory Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Office Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Emergency Contact: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

                                    *(Name and Phone Number)*

Location(s) covered by this SOP: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

                                                *(Building/Room Number)*

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**Type of SOP:** Process Hazardous Chemical Hazardous Class

**Purpose**

Hydrochloric acid is a highly corrosive, strong inorganic/mineral acid. If not stored and handled properly, this can pose a serious threat to the health and safety of laboratory personnel, emergency responders and chemical waste handlers. Hence, it is important to follow safety protocols to handle this chemical. Hydrochloric acid is used in the chemical industry as a chemical reagent in the large-scale production of vinyl chloride for PVC plastic, and MDI/TDI for polyurethane. It has numerous smaller-scale applications, including household cleaning, production of gelatin and other food additives, descaling, and leather processing.

**Physical & Chemical Properties/Definition of Chemical Group**

CAS# 7647-01-0

Class: **Corrosive**

Molecular Formula: HCl

Form (Physical State): Colorless liquid.

Boiling Point: > 100 °C (> 212 °F) - lit.

Melting point: -30 °C (-22 °F)

Density: 1.2 g/cm3 at 25 °C (77 °F)

Odor: Pungent

Synonym: Muriatic acid

**Potential Hazards/Toxicity**

Pictogram



**Potential Health Effects**

**Inhalation** May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

**Skin** May be harmful if absorbed through skin. Causes skin burns.

**Eyes** Causes eye burns.

**Ingestion** May be harmful if swallowed.

**Signs and Symptoms of Exposure**

Burning sensation, cough, wheezing, laryngitis, shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis & pulmonary edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

**Personal Protective Equipment (PPE)**

**Respiratory protection**

Respirators should be used only under any of the following circumstances:

* As a last line of defense (i.e., after engineering and administrative controls have been exhausted).
* When Permissible Exposure Limit (PEL) has exceeded or when there is a possibility that PEL will be exceeded.
* Regulations require the use of a respirator.
* An employer requires the use of a respirator.
* There is potential for harmful exposure due to an atmospheric contaminant (in the absence of PEL)
* As PPE in the event of a chemical spill clean-up process

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by ORS and should contact occhealt@uga.edu. This is a UGA requirement described in more detail in the [UGA Respiratory Protection Plan](https://esd.uga.edu/sites/default/files/respiratoryprotection.pdf) and supported by the [Office of Research Occupational Health and Safety Program](https://research.uga.edu/ohsp/).

**Hand protection**

Type of gloves recommended for Hydrochloric acid: ***Nitrile***

Note: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with Hydrochloric acid.

**Eye protection**

Type of eye protection used to handle the chemical: *Splash goggles. If used in large quantities, please use appropriate face shield.*

**Skin and body protection**

*Lab coat, long pants, closed-toed shoes*

**Hygiene measures**

Avoid contact with skin, eyes and clothing.

Wash hands before breaks and immediately after handling Hydrochloric acid.

**Engineering Controls**

* All operations involving Hydrochloric acid must be carried out in a certified chemical fume hood.
* Laboratory rooms must be at negative pressure with respect to the corridors and external environment. To achieve this, the laboratory/room door must be kept closed at all times.

**First Aid Procedures**

**General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water for at least 15 minutes. Consult a physician.

**In case of eye contact**

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

**If swallowed**

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**Special Handling and Storage Requirements**

**Precautions for safe handling**

Avoid contact with skin and eyes.

Avoid inhalation of vapor or mist.

Always use inside a chemical fume hood.

Note: In case you need to dilute the concentration of HCl, always add acid to water.

Always transfer from container to the receptacle by using an appropriate funnel.

DO NOT mouth-pipette HCl.

**Conditions for safe storage**

Do not store in/with combustible packing material; such as cardboard, Styrofoam, plastic and paper.

Keep container upright & tightly closed in a dry and well-ventilated place.

Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Always store HCl in a secondary container. Note: Nalgene/polypropylene tray or a tub is the best suited secondary containment.

Materials to avoid:Store segregated from – Organic Acids, Bases, Amines, Alkali metals, Metals, permanganates, e.g. potassium permanganate, sodium hypochlorite (bleach), Fluorine, metal acetylides, hexalithium disilicide.

**Spill and Accident Procedure**

**Chemical Spill Dial 911**

**24-7 On-Call Response to Research, Environment, Health or Safety Concerns Dial 2-5561 from a campus phone or 706-542-5561 from a non-campus line.**

**Spill** – Follow the procedures set out in the [UGA Chemical and Laboratory Safety Manual.](http://research.uga.edu/docs/units/safety/manuals/Chemical-Laboratory-Safety-Manual.pdf)

[If there are any chemical-specific protocols for responding to a spill, insert them here or mark “none”:]

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# **Medical Emergency Dial 911**

**Life Threatening Emergency, After Hours, Weekends And Holidays** – Dial **911** or the emergency phone numbers listed at the beginning of the UGA Chemical and Laboratory Safety Manual

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Non-Life Threatening Emergency** – Follow the instructions in the UGA Chemical and Laboratory Safety Manual.

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Decontamination/Waste Disposal Procedure**

**For general hazardous waste disposal procedures, see Appendix H of the UGA Chemical and Laboratory Safety Manual.**

**Chemical Specific Procedures: [to be inserted or marked as “none”]**

Wearing proper PPE, please decontaminate equipment and bench tops using soap and water. Please dispose of the spent hydrochloric acid and disposables contaminated with hydrochloric acid as hazardous waste.

**Safety Data Sheet (SDS) Location**

UGA personnel can access Online SDS through a link in the upper left corner of the ESD home page (<https://esd.uga.edu>) and logging in by using their UGA email user name and password.

**Protocol/Procedure**

(Add specific description of procedure)

**NOTE**

Any deviation from this SOP requires approval from PI.

**Documentation of Training** (signature of all users is required)

* Prior to conducting any work with Hydrochloric acid, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and access to the SDS provided by the manufacturer.
* The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last 12 months.

I have read and understand the content of this SOP:

**Name Signature Date**

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