

Standard Operating Procedure (SOP) for (Hydrpchloric Acid)

PI Name: Yat Li

Date: 10/12/2012

Name of Lab or Unit: PSB 198

Review any applicable manufacturer/vendor safety information before developing Standard Operating Procedure (SOP) and append UC Approved Chemical SOP, if available, or SDS and other Chemical reference materials if UC Chemical SOP is not available.

#1	<p><u>Scope of Work/Activity:</u> Describe the experiment purpose/scope.</p> <p>Hydrochloric acid is widely used for various process of synthesizing of nanowires to adjust pH value</p> <p>Apparatus: chemical fume hood, micropipettor</p>
#2	<p><u>Specific Safety and Environmental Hazards:</u> State the specific hazard and consequences to person, environment, or property if procedure not followed.</p> <p>Corrosive – causes severe eye and skin burns; can cause digestive and respiratory tract burns</p> <p>Irritant – eye, skin, respiratory tract, digestive tract</p>
#3	<p><u>Describe in detail how the hazards will be controlled.</u></p> <p>a. Identify the Engineering Controls (e.g., fume hood, interlocks, shielding), work Practices or Procedures, or Personal Protective Equipment (e.g., gloves, respirator) that will be employed to reduce hazards to acceptable levels. All operations involving concentrated hydrochloric acid should be carried out in a chemical fume hood with the sash in the down position, between your chest and what you are handling in the hood. Personal protective equipment should be obeyed according to section #5</p> <p>b. Address emergency shutdown procedures.</p>
#4	<p><u>Designated Area:</u> Indicate the area designated for performing this process in the laboratory.</p> <p>All the work involving concentrated hydrochloric acid should be conducted in chemical fume hood.</p>
#5	<p><u>Personal Protective Equipment (PPE):</u> State the personal protective equipment selected and required. Examples: safety glasses, goggles or face shield; lab coat; specific gloves; chemical-proof apron; respiratory protection.</p> <ol style="list-style-type: none"> 1. Avoid breathing vapors 2. Safety glasses 3. Lab coat 4. Long Pants 5. Closed toe shoes 6. Appropriate chemical resistance gloves
#6	<p><u>Important Steps to Follow:</u> List the specific sequence of steps staff should follow to mitigate potentially hazardous conditions.</p> <ol style="list-style-type: none"> 1. Before handling, correctly calculate the amount needed 2. Use micropipettor to transfer concentrated hydrochloric acid in chemical fume hood 3. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. 4. For splitting liquids, dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

#7	<p><u>Emergency / First Aid Procedures:</u></p> <p>Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.</p> <p>Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.</p> <p>Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.</p> <p>Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.</p> <p>Serious Inhalation: Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.</p> <p>Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.</p>
#8	<p><u>Training & Competency Requirements:</u> Describe necessary training and demonstration of competency for performing the hazardous operation.</p> <ol style="list-style-type: none"> 1. Prior to conducting any work with Ammonium metavanadate, 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. 2. The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and a copy of Ammonium metavanadate MSDS provided by the manufacturer. Read MSDS and SOP before use. 3. The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last two years.
#9	<p><u>Identify hazardous waste(s) generated:</u> List expected concentrations and amounts of hazardous waste(s) generated during this process. Contact EH&S for specific guidance regarding hazardous waste handling and disposal.</p> <p>Place waste in labeled waste liquid container with hazardous waste tag complete.</p>
#10	<p>Decontamination and spill clean-up procedures (reference embedded specific Chemical SOP as needed)</p> <p>Small spills: Do not attempt clean-up if you feel unsure of your ability to do so or if you perceive the risk to be greater than normal laboratory operation. The contaminated area should be covered with sodium bicarbonate taking care to avoid any foaming or splattering that may occur from the neutralization reaction of the acid with these materials. Test pH using pH test paper. Continue adding sodium bicarbonate until pH reaches 7. Collect and dispose of in trashcan. Wash contaminated area with water and soap.</p> <p>Large Spills: Notify others in the area. Notify stockroom supervisor. Evacuate room and notify EH&S.</p>
#11	<p><u>Laboratory Emergency Response Equipment:</u> All research personnel must know location of nearest fire alarm pull station and emergency shower/eyewash.</p> <ol style="list-style-type: none"> a. Note location and use of any emergency response equipment specific to process (e.g., Calgonate gel, Class D fire extinguisher)

As the Principal Investigator, it is your responsibility to ensure that all individuals conducting this protocol are taught the correct procedures for safe handling of the hazardous materials involved. It is also your responsibility to assure that your personnel complete Laboratory Safety Training and other applicable safety training courses.

I have reviewed and approve this Standard Operating Procedure.

PI Signature:

DATE

Note that personnel associated with the protocol must sign the acknowledgement at the end of this document.

(Insert UC approved Chemical Specific SOPs/Lab Chemical Safety Summaries here)

(Example Template from UC Approved Chemical SOPs)

Chemical Hazards and Controls

Click here to enter chemical name or class.

This is a Chemical Hazard and Control template and is not complete until: 1) Chemical specific information is entered into the boxes below 2) It is appended to the protocol/procedural SOP and 3) Complete SOP has been signed and dated by the PI and relevant lab personnel.

Print a copy and insert into your
Laboratory Safety Manual and Chemical Hygiene Plan with the Procedural SOP.
Refer to instructions for assistance.

Department:	Click here to enter text.
Date SOP was written:	Click here to enter a date.
Date SOP was approved by PI/lab supervisor:	Click here to enter a date.
Principal Investigator:	Click here to enter text.
Internal Lab Safety Coordinator/Lab Manager:	Click here to enter text.
Lab Phone:	Click here to enter text.
Office Phone:	Click here to enter text.
Emergency Contact:	Click here to enter text. (Name and Phone Number)
Location(s) covered by this SOP:	Click here to enter text. (Building/Room Number)

Physical & Chemical Properties/Definition of Chemical Group

CAS#: Click here to enter text.

Class: Click here to enter text.

Molecular Formula: Click here to enter text.

Structure:

Molecular Weight: Click here to enter text

Form (physical state): Click here to enter text.

Density: Click here to enter text

Color: Click here to enter text.

Solubility: Click here to enter text.

Boiling point: Click here to enter text.

Melting point: Click here to enter text.

Toxicity LD₅₀: Click here to enter text.

Potential Hazards/Toxicity

Click here to enter text. Include acute toxicity data (e.g., LD₅₀)

Inhalation

Eye Contact

Skin Contact

Ingestion

Personal Protective Equipment (PPE)

Respiratory Protection

Click here to enter text.

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 there is a possibility that a Cal/OSHA Permissible Exposure Limit (PEL) or Action Level (AL) 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 a PEL).
- As protective equipment during a chemical spill clean-up process (only when approved by EH&S).

Lab personnel intending to use a respirator must be trained and fit-tested by EH&S. This is a regulatory requirement.

<http://ehs.ucsc.edu/programs/safety-ih/respiratory-protection.html>

Hand Protection

Click here to enter text.

NOTE: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with [Click here to enter chemical name or class.](#)

Refer to glove selection charts from the links below:

http://www.ansellpro.com/download/Ansell_8thEditionChemicalResistanceGuide.pdf

OR

<http://www.allsafetyproducts.biz/page/74172>

OR

<http://www.showabestglove.com/site/default.aspx>

OR

<http://www.mapaglove.com/>

Eye Protection

Click here to enter text.

Skin and Body Protection

Click here to enter text.

Hygiene Measures

Click here to enter text.

Engineering Controls

Click here to enter text.

First Aid Procedures

If inhaled

Click here to enter text.

In case of skin contact

Click here to enter text.

In case of eye contact

Click here to enter text.

If swallowed

Click here to enter text.

Special Handling and Storage Requirements

Click here to enter text.

Incompatible with the Following Materials

Click here to enter text.

Spill and Accident Procedure

Chemical Spill Dial 911

Spill – Dial **911** and ask for EH&S assistance or call EH&S directly x459-2553.

Chemical Spill on Body or Clothes – Remove clothing and rinse body thoroughly in emergency shower for at least 15 minutes. Seek medical attention if needed. *Notify supervisor and EH&S via 911 immediately.*

Chemical Splash Into Eyes – Immediately rinse eyeball and inner surface of eyelid with water from the emergency eyewash station for 15 minutes by forcibly holding the eye open. Seek medical attention. *Notify supervisor and EH&S via 911 immediately.*

Mucous Membrane Exposure: Flush the affected area for 15 minutes using an eyewash station.

Needlestick/Puncture Injuries – Wash the affected area with soap and warm water for 15 minutes. For employees, follow the instructions at the Risk Services website: <http://risk.ucsc.edu/workerscomp/injuryreportinghowto.html>

Medical Emergency Dial 911

Life Threatening Emergency, After Hours, Weekends And Holidays – Dial **911**

Non-Life Threatening Emergency – For employees, follow the instructions at the Risk Services website: <http://risk.ucsc.edu/workerscomp/injuryreportinghowto.html>

Note: All serious injuries must be reported to EH&S as soon as possible.

Decontamination/Waste Disposal Procedure

Contaminated instruments and benches should be decontaminated with soap and water. All waste and contaminated disposables should be disposed of as hazardous waste according to the guidelines below.

Waste Procedures

General hazardous waste management guidelines: <http://ehs.ucsc.edu/programs/waste-management/index.html>

Waste Labeling

- Affix an on-line hazardous waste tag on all waste containers using the Online Tag Program (OTP) <http://otp.ucop.edu/> as soon as the first drop of waste is added to the container.

Waste Storage

- Store hazardous waste in closed containers, in clean secondary containment, segregated by hazard class, in a marked and designated waste accumulation area.
- Double-bag dry waste using transparent bags.
- Waste accumulation area must be under the control of the person generating the waste.

Waste Disposal

- Hazardous waste must be removed from the lab within 180 days.
- Containers must be clean, sealed, and safe to transport.
- Mark container as ready for pick up in OTP, move container to accumulation area.

- Contact EH&S at x9-3086 for questions

Safety Data Sheet (SDS) Location

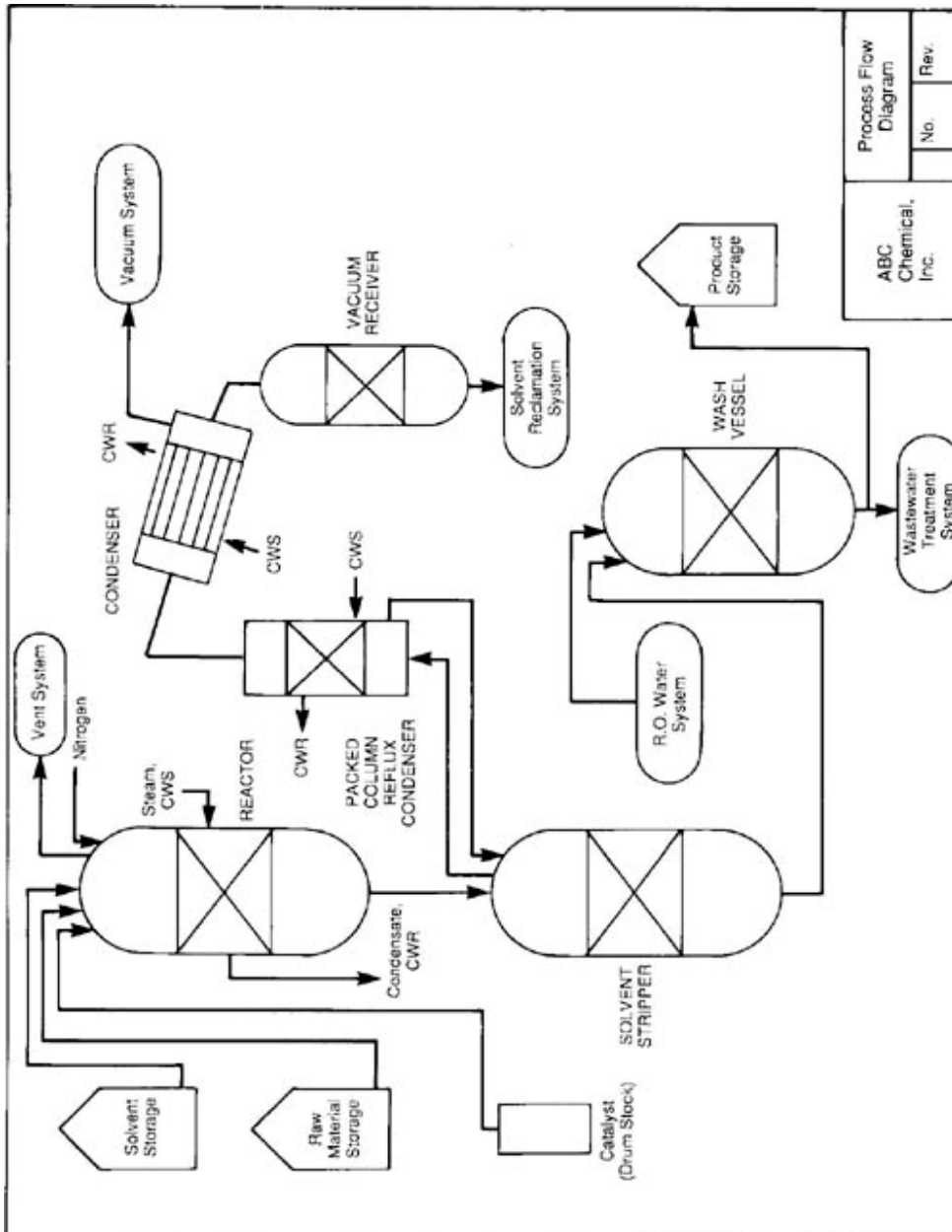
Online SDSs can be accessed at: <http://www.ucmsds.com/?X>.

NOTE

Any deviation from this Procedural/Chemical Handling SOP requires approval from PI.

Documentation of Training (signature of all users is required)

- Prior to conducting any work with [Click here to enter chemical name or class.](#), the PI or designee must provide training to his/her laboratory personnel regarding the specific 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 a copy of 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 year.



ABC Chemical, Inc.	Process Flow Diagram	
	No.	Rev.