

## LAB SPECIFIC OPERATING PROCEDURE (LSOP) for Acetyl chloride

Principal Investigator (PI):

Building:

Lab(s) Covered by LSOP:

Department:

Lab Phone Number(s):


### SECTION 1. PHYSICAL & CHEMICAL PROPERTIES

CAS-No. : 75-36-5 EC-No. : 200-865-6 Index-No. : 607-011-00-5

Properties	
Chemical formula	CH <sub>3</sub> COCl
Molar mass	78.49 g/mol
Appearance	Colorless liquid
Density	1.104 g/ml, liquid
Melting point	-112 °C (-170 °F; 161 K)
Boiling point	52 °C (126 °F; 325 K)
Solubility in water	Reacts with water
Magnetic susceptibility (x)	-38.9·10 <sup>-6</sup> cm <sup>3</sup> /mol

DOT (US) UN number: 1717 Class: 3 (8) Packing group: II Proper shipping name: Acetyl chloride Reportable Quantity (RQ): 5000 lbs./ Poison Inhalation Hazard: No

### SECTION 2. OSHA's (GHS)-SDS INFORMATION

Chemical Name	GHS Pictogram(s)	Generic Chemical Definition
Acetyl Chloride		<b>Acetyl chloride</b> , CH <sub>3</sub> COCl is an <a href="#">acid chloride</a> derived from <a href="#">acetic acid</a> . It belongs to the class of <a href="#">organic compounds</a> called <a href="#">acyl halides</a> . It is a colorless, corrosive, volatile <a href="#">liquid</a> . Acetyl chloride is not expected to exist in nature, because contact with <a href="#">water</a> would <a href="#">hydrolyze</a> it into acetic acid and <a href="#">hydrogen chloride</a> . In fact, if handled in open air it releases white "smoke" resulting from hydrolysis due to the moisture in the air. The smoke is actually small droplets of <a href="#">hydrochloric acid</a> and <a href="#">acetic acid</a> formed by hydrolysis. Acetyl chloride is used for acetylation reactions, i.e., the introduction of an acetyl group. Acetyl is an <a href="#">acyl</a> group having the formula-C(=O)-CH <sub>3</sub> . For further information on the types of chemical reactions compounds such as acetyl chloride can undergo, see <a href="#">acyl halide</a> . Two major classes of acetylations include <a href="#">esterification</a> and the <a href="#">Friedel-Crafts reaction</a> .

OSHA's GHS Signal Word is (DANGER)

### SECTION 3. GHS HAZARD (H) CODES and PRECAUTIONARY STATEMENT (P) CODES

(H)/Hazard Statement (s)

Classification of the substance or mixture GHS Classification in accordance with 29 CFR 1910 (OSHA HCS) Flammable liquids (Category 2), H225 Skin corrosion (Category 1B), H314 Serious eye damage (Category 1), H318 Acute aquatic toxicity (Category 3), H402	
H225 Highly flammable liquid and vapor	
H314 Causes severe skin burns and eye damage.	
H402 Harmful to aquatic life	
<b>(P)/Precautionary Statement (s)</b>	
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.	
P403 + P235 Store in a well-ventilated place. Keep cool.	
P405 Store locked up.	
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.	
<b>SECTION 4. ADMINISTRATIVE CONTROLS</b>	
1.	Lab-specific safety training must be provided by the principal investigator (PI) or other qualified personnel to all researchers working with <b>Acetyl Chloride</b> .
2.	The PI must perform a Workplace Hazard Assessment ( <b>WHA</b> ) form for Laboratories at, <a href="http://research.uchc.edu/wp-content/uploads/sites/1137/2015/09/workplace_hazard_assessment.pdf">http://research.uchc.edu/wp-content/uploads/sites/1137/2015/09/workplace_hazard_assessment.pdf</a>
3.	Researchers must <b>not work alone</b> with <b>Acetyl Chloride</b> . Please note that UCONN Health/Storrs has a <b>Working Alone Policy</b> , found at <a href="http://content.research.uconn.edu/pdf/uch/rcs/ehs/policy-workingalone2017.pdf">http://content.research.uconn.edu/pdf/uch/rcs/ehs/policy-workingalone2017.pdf</a>
4.	Documentation of training is required and satisfied upon review and sign-off of this LSOP and submission to EH&S for approval.
5.	In addition to reviewing this document, you must review the Safety Data Sheet ( <b>SDS</b> ) for <b>Acetyl Chloride</b> prior to use, and instruct your employees.
6.	Whenever possible, find <b>safer substitutes or reduce</b> the quantities of <b>Acetyl Chloride</b> .
7.	Experiments should be performed <b>during normal business hours</b> (e.g.) 8:00 am-5:00 pm Mon-Fri) if possible.
8.	Multiple transfers of small volumes/quantities of <b>Acetyl Chloride</b> are preferred over a single transfer of larger volumes/quantities.
9.	Any handling of <b>Acetyl Chloride</b> requires supervision from the Lab supervisor, PI or other experience employee.
<b>SECTION 5. ENGINEERING CONTROLS</b>	
10.	Chemical fume hoods must be running at over 90 linear feet/minute and tested by EH&S within the last year.
11.	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.
12.	Ensure that eyewash stations and safety showers are proximal to the workstation location and tested accordingly.
13.	EH&S certifies flow rates of fume hoods for UCONN Health, contact EH&S at 860-679-2723 for re-test.
14.	If the hood is not working properly, contact Facilities to repair the hood at 860-679-2125.
15.	Work with <b>Acetyl Chloride</b> – <b>the work must be conducted in a suitable/rated fume hood.</b>
16.	Sash height must be kept as low as possible to avoid escaping fumes and provide a physical barrier.
<b>SECTION 6. PERSONAL PROTECTIVE EQUIPMENT</b> <i>(At a minimum, the following PPE must be worn at all times.)</i>	
<b>Eye and Face Protection</b>	
In case of eye contact-rinse thoroughly with plenty of water using an eyewash station for at least 15 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses if possible.	
17.	Eye/face protection Tightly fitting safety goggles. Face shield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). ANSI Z87.1-compliant safety glasses with side shields, or chemical splash goggles.

18.	Ordinary prescription glasses will NOT provide adequate protection unless they also meet ANSI standard and have compliant side shields.
<b>Skin and Body Protection</b>	
Skin protection Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.	
19.	<b>Splash contact Material: butyl-rubber</b> Minimum layer thickness: 0.3 mm Break through time: 146 min Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M) data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374 If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.
20.	Body Protection Complete suit protecting against chemicals, <b>Flame retardant antistatic protective clothing.</b> , The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace
21.	Lab coats are required when handling hazardous chemicals in the lab. Select the type of lab coat according to the substances at the specific workplace.
22.	Long pants, closed-toe/closed-heel shoes, covered legs, and ankles.
<b>SECTION 7. SPECIAL HANDLING &amp; STORAGE REQUIREMENTS</b>	
<b>Conditions for safe handling</b>	
23.	Precautions for safe handling Avoid inhalation of vapor or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build-up of electrostatic charge
24.	Eliminate or substitute for a less hazardous material when possible.
25.	Design your experiment to use the least amount of material possible to achieve the desired result.
26.	Do not exceed the scale of procedures specified in Protocol/Procedure section without approval of the PI.
27.	Verify your experimental set-up and procedure prior to use.
28.	Know the location of the nearest eyewash, safety shower and fire extinguisher before beginning work.
29.	Upon leaving the work area, remove any personal protective equipment worn and wash hands.
30.	At the end of each project, thoroughly decontaminate the work area according to the material being handled.
<b>Conditions for safe storage</b>	
31.	Conditions for safe storage, including any incompatibilities Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. <b>Keep away from water. Never allow product to get in contact with water during storage.</b> Hydrolyses readily.
32.	Handle and store <b>Acetyl Chloride under inert gas.</b>
33.	<b>Acetyl Chloride</b> is incompatible with materials Water, Alcohols, Oxidizing agents, Strong bases
34.	<b>Acetyl Chloride</b> vapors may form explosive mixture with air.
35.	<b>Acetyl Chloride Reacts violently with water and moisture in air</b>
<b>SECTION 8. SPILLS, ACCIDENTS &amp; EMERGENCY PROCEDURES</b>	
36.	Call <b>911 or 7777</b> from landline if <b>Life Threatening</b> and call EH&S at <b>860-679-2723</b> for <b>Non-Life Threatening</b> Spill Coordination efforts.

37.	Evacuate the laboratory and inform others in the immediate area to leave the work area. Evacuate the laboratory calmly yet safely, and rally at the <b>Emergency Assembly Area (EAA)</b> as designated by the Fire Department
38.	The <b>(EAA)</b> is a pre-determined safe zone for employees to meet during an emergency.
39.	Upon evacuation, also try to <b>minimize damage; isolate/contain</b> if able. (e.g.) open hoods to accelerate dissipation in air, hit HVAC purge button to increase laboratory air changes, disconnect electrical sources etc.
40.	Upon Evacuation, close door(s) to lab and post a “ <b>NO ENTRY</b> ” sign(s) or other warning information on the door.
41.	The <b>Emergency Evacuation Attendants (EEA)</b> are those who have been assigned take roll call of employees and report to the <b>Emergency Evacuation Coordinator (EEC)</b>
42.	No one shall be permitted to leave the <b>Emergency Assembly Area (EAA)</b> until the scene has been determined safe for re-entry by the On-Scene <b>Emergency Coordinator (EC)</b> -Senior Fire Department Official.
43.	<b>Do not re-enter</b> the lab/area until instructed to do so by the On-Scene <b>Emergency Coordinator (EC)</b> -Senior Fire Department Official.
44.	Should the <b>Emergency Assembly Area (EAA)</b> be compromised, <b>evacuees will be instructed by Emergency Evacuation Attendants (EEA’s) or the Emergency Evacuation Coordinator (EEC) to re-locate to a secondary Emergency Assembly Area (SEAA)</b>
45.	EH&S recommends that individual labs discuss emergency response and readiness at their laboratory meetings and practice drill. EH&S can aid in this effort along with Public Safety.
46.	Report Spills, accidents which are also deemed non-life threatening or non-emergency situations to your respective PI/Supervisor and EH&S.

### SECTION 9. FIRST AID PROCEDURES *(Have your SDS Available for First Responders)*

<b>First Aid- Eyes</b>	<ol style="list-style-type: none"> <li>1. Remove contact lenses (if applicable)</li> <li>2. Forcibly hold eyelids open and flush eyes under eyewash for 15 minutes</li> <li>3. If pain persists after 15 minutes, dial <b>911</b></li> <li>4. Keep flushing eyes until emergency personnel arrives</li> <li>5. Report incident to PI/Supervisor and EH&amp;S.</li> </ol>
<b>First Aid- Skin</b>	<ol style="list-style-type: none"> <li>1. Remove contaminated clothing (if applicable)</li> <li>2. Flush affected area(s) under safety shower for 15 minutes</li> <li>3. If pain persists after 15 minutes, dial <b>911</b></li> <li>4. Keep rinsing affected area until emergency personnel arrives</li> <li>5. Report incident to PI/Supervisor and EH&amp;S.</li> <li>6. Needle stick/puncture exposure-wash the affected area with antiseptic soap and warm water for 15 minutes.</li> </ol>
<b>First Aid- Inhalation</b>	<ol style="list-style-type: none"> <li>1. Move to fresh air</li> <li>2. Dial <b>911</b></li> <li>3. Report incident to PI/Supervisor and EH&amp;S.</li> </ol>

### SECTION 10. HAZARDOUS WASTE MANAGEMENT-(GENERAL)

48.	All hazardous wastes must be labeled with “Hazardous Waste” stickers or tags, use full chemical names to describe the waste (i.e. no chemical abbreviations or symbols), have 100% of the constituents by volume identified and be stored in containers with tight-fitting caps or lids, and be segregated by chemical compatibility.
49.	Hazardous wastes must be stored at or near a green (S.A.A.) aka “Satellite Accumulation Area” sign prior to disposal by EH&S.
50.	Hazardous wastes must accumulate under the control of the generator, with a container maintained in good condition, free of exterior residues on container or in the spill tray. All spills and residues must be immediately cleaned up.
51.	Hazardous wastes must be transferred within a chemical fume hood but then be removed for temporary storage with the generator’s respective (SAA). When chemical waste is being transferred is the only time that it may remain open. Closed, means that no liquid will spill from a waste collection container, should the container be knocked over/inverted.
52.	All <b>Acetyl Chloride</b> solutions and contaminate solids will be collected and characterized by EH&S as chemical hazardous waste

### SECTION 11. SPECIFIC PROCEDURE *(left blank intentionally; please see & follow instructions)*

*(Document the Experiment Information with regard to use of **Acetyl Chloride**, too include the procedures for disposal of the waste and the selection and application of correct PPE)*

**Instructions As Follows:**

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**SECTION 12.**

**APPROVAL**

I have reviewed, understand and agree to follow this LSOP regarding **Acetyl Chloride** liquids and solids. Failure to follow the LSOP and lab-specific training guidelines for research with **Acetyl Chloride** is a violation of the University Health & Safety Policy and University Code of Conduct. Further approval from the PI is required if any of the following events occur:

- A change in the agreed-upon experimental set-up is planned
- Signs of a failure in safety design or equipment are observed
- Signs or symptoms of a chemical exposure to any personnel are observed
- Unexpected and/or potentially dangerous experimental results occur (e.g., fire, uncontrolled buildup of heat and/or pressure, etc.)

**PLEASE ENSURE THAT THIS LSOP AND THE SDS ARE REVIEWED, TRAINED UPON AND UNDERSTOOD BY END USERS. THIS FORM IS DESIGNED TO NOT ONLY PROVIDE UCONN HEALTH WITH RISK MITIGATION BUT FOR THE PRINCIPAL INVESTIGATOR AS WELL. PLEASE SEND A COPY OF THE COMPLETED LSOP TO EH&S FOR REVIEW AND APPROVAL. EH&S APPRECIATES YOUR COOPERATION WITH THIS MATTER.**

Researcher Signature	Date	Trainer Signature	Training Date

**SECTION 13.**

**PRINCIPAL INVESTIGATOR CERTIFICATION**

**I approve the contents of the lab-specific standard operating procedure listed above:**

<b>PI Signature:</b>	<b>Date:</b>
<b>Date sent to EH&amp;S for Review and Approval:</b>	<b>Date:</b>