



# Lab Conduct, Practices and Record Keeping



B3 Summer Science Camp  
at Olympic High School

# Notes on Lab Conduct and Practice

- Personal Protection
  - Put backpacks and coats in the front hall (or adjacent classroom which will be open)
  - Food and drink may never be brought into the lab
  - Wear a lab coat at all times in the lab and removed when you leave the lab
  - Eye protection is usually optional (we will warn you when it is not)
  - Gloves are worn for most procedures – generally change them only when you may have contaminated them.
- Safety:
  - Know where the fire extinguisher, chemical spill kit, first-aid kit, shower and eye wash stations are.
  - Make sure you know how and where to dispose of pipettes and micropipette tips, tubes, residual solutions, sharps (broken glass, razor blades and needles)
  - Know how to find the Material Data Safety information on the chemicals that we use (online – bookmarked)

# Continued....

- It is impossible to do too much labeling. Both tubes and racks should be labeled. Decide on a system and stick to it, and *always reference it in your lab notebook*. **For Example:**
  - Name (J Weller) or initials (JW) or team designation (T1 – T6 or color of pipetter set)
  - Date
  - Identifier ('sample 1' might be OK, if there is only one sample that you are storing from that day).
    - Units: you should want to label a tube with any known concentration of sample:  
Solanum lycopersicum cpDNA 10ug/ul → SLcpDNA 10γ/λ
- No Unauthorized Experiments.

Intentionally ignoring personal or group safety or conducting unauthorized experiments or interfering with the experiments of others is grounds for failure and immediate dismissal from the class.

# Material Safety Data Sheets

HC-12a/HC-22a

## MATERIAL SAFETY DATA SHEET

(Complies with OSHA Communication Standard 29 CFR 1910.1200 Department of Labor)

<b>IDENTITY:</b>		Compressed Gas - Flammable NOS		24-Hour Emergency Telephone Number	
HC-12a		Liquefied Petroleum		(208) 687-7000	
HC-22a		UN 1954 Class 2		(208) 755-3087	
<b>Section I:</b>					
<b>Manufacturer's Name</b>		<b>Emergency Telephone Number</b>			
OZ Technology, Inc.		(208) 687-7000			
<b>Address</b>		<b>Telephone Number for Information</b>			
10278 N. Church Rd.		(208) 687-7000			
Rathdrum, ID 83858, U.S.A.		<b>Date Prepared</b>			
		April 11, 2002			
		<b>Signature of Preparer (Optional)</b>			
		Not Applicable			
<b>Section II: Hazardous Ingredients / Identity Information</b>					
<b>Hazardous Components (Specific Chemical Identity; Common Name(s))</b>		<b>OSHA PEL</b>	<b>ACGIH</b>	<b>Other Limits Recommended</b>	<b>%(Optional)</b>
Trade Secret - HC-12a/HC-22a					
Compressed Hydrocarbon Mixture		TWA/PEL	OSHA	1800 Mg	100%
		Asphyxiant			
<b>Section III: Physical / Chemical Characteristics</b>					
<b>Boiling Point</b>		<b>Specific Gravity (H<sub>2</sub>O = 1)</b>			
HC-12a: -29.0°F / HC-22a: -40°F		0.552			
<b>Vapor Pressure (PSIG)</b>		<b>Melting Point</b>			
HC-12a: 72 @ 70° F. / HC-22a: 110 @ 70° F		Not Applicable			
<b>Vapor Density (Air = 1)</b>		<b>Evaporation Rate (Butyl Acetate = 1)</b>			
1.770		Not Available			
<b>Solubility in Water</b>		<b>Ignition Temperature (Method used: Heated Metal Surface)</b>			
Soluble		1490° F.			
<b>Appearance and Odor</b>		<b>Auto-ignition Temperature</b>			
Colorless gas with natural gas odor		1627° F.			
<b>Section IV: Fire and Explosion Hazard Data</b>					
<b>Flash Point (Method Used)</b>		<b>Flammable Limits</b>		<b>LEL</b>	<b>MEL</b>
Not Determined		% Upper 8.5; % Lower 1.9		N/A	N/A
<b>Extinguishing Media</b>					
Use a water spray to cool fire-exposed containers, structures, and to protect personnel.					
<b>Special Fire Fighting Procedures</b>					
Shut off source of flow. Do not extinguish fire if gas source cannot be shut off. Use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.					
<b>Unusual Fire and Explosion Hazards</b>					
Heavy concentrations of vapor may form flammable mixtures with air. Heavy concentrations of vapor or gas may spread to distant ignition sources and flash back. Vapor or gas may accumulate in low or confined areas. Dangerous when exposed to flame or high temperature sparks. Containers may rupture when heated above their rated pressure values.					

<b>Section V: Reactivity Data</b>			
<b>Stability</b>	Unstable	<b>Conditions to Avoid</b>	
	Stable	X	Heat, Strong oxidizers, Peroxides, Plastics, and Chlorine dioxide
<b>Incompatibility (Materials to Avoid)</b>			
Strong oxidizers, Peroxides, Plastics, and Chlorine dioxide			
<b>Hazardous Decomposition or By-products</b>			
When burned in a deficiency of oxygen, CO can form			
<b>Hazardous Polymerization</b>	May occur	<b>Conditions to Avoid</b>	
	Will not occur	X	Strong oxidizers, Peroxides, Plastics, and Chlorine dioxide
<b>Section VI: Health Hazard Data</b>			
<b>Route(s) of Entry</b>	<b>Inhalation ?</b>	<b>Skin ?</b>	<b>Ingestion ?</b>
	Yes	Yes	Not Applicable
<b>Health Hazards (Acute and Chronic)</b>			
Central nervous system depressant. Asphyxiant Heavy exposure may cause anemia and irregular heart rhythm, respiratory arrest, and death.			
<b>Carcinogenicity</b>	<b>NIP ?</b>	<b>ARC Monographs ?</b>	<b>OSHA Regulation ?</b>
		Presently not on any list	
<b>Signs and Symptoms of Exposure</b>			
Difficulty in breathing, dizziness, euphoria, and irritation of nose and throat. Contact with liquefied material may cause frostbite.			
<b>Medical Conditions Generally Aggravated by Exposure</b>			
Hydrocarbons may sensitize the heart to epinephrine and other circulating catecholamines.			
<b>Emergency and First Aid Procedures</b>			
Do not give epinephrine. Immerse frostbite in cool-warm water. Inhalation: remove from place of exposure. Insure breathing. Give oxygen or CPR if needed.			
<b>Section VII: Precautions for Safe Handling and Use</b>			
<b>Steps To Be Taken in Case Material is Released or Spilled</b>			
No flares or open flames in hazard area. Do not touch or walk through spilled materials. Use water spray to reduce vapors. Isolate and ventilate area until gas has dispersed. No special procedures are required for clean up. Avoid methods resulting in water pollution.			
<b>Waste Disposal Method</b>			
This material is not specifically listed as hazardous waste, but can be classified as hazardous waste when contaminated or if seen as ignitable under (40 CFR261).			
<b>Precautions To Be Taken in Handling and Storing</b>			
Store in tightly closed containers in cool, dry, isolated, well ventilated area away from heat and sources of ignition.			
<b>Other Precautions</b>			
Empty containers may contain flammable or combustible residue vapors. Do not cut, grind, drill, weld, or reuse containers without adequate precautions.			
<b>Section VIII: Control Measures</b>			
<b>Respiratory Protection (Specify Type)</b>			
NIOSH Approved			
<b>Ventilation</b>	<b>Local Exhaust</b>	<b>Yes</b>	<b>Special</b>
	<b>Mechanical (General)</b>	None	None
<b>Protective Gloves</b>		<b>Eye Protection</b>	
Use if in contact with liquid material		Use proper eye protection	
<b>Other Protective Clothing or Equipment</b>			
Long sleeves and long pants			
<b>Work / Hygienic Practices</b>			
Avoid open flames or ignition sources in excess of 1490° F			

# MSDS Labels



**SuperClean Anything Cleaner**

MSDS #: 84945 PPE: Gloves  
Mix: 1oz /32 oz.  
Super Chemical Corporation  
123 Chemical Drive  
New York, NY 34344

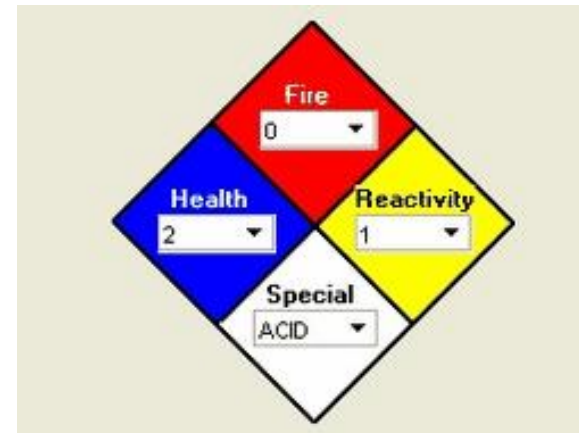
Emergency Phone: 800-555-5555

Target: Lungs, Stomach  
Contents:  
Sodium Chloride, Benzine, Petroleum

Directions:  
IF SWALLOWED: Induce vomiting, contact physician.  
IF SKIN CONTACT: Wash thoroughly with cold water and soap,  
contact physician if irritation occurs.

ABC Cleaning Corporation

The label features a diamond-shaped hazard pictogram with four colored quadrants: red (top) with '0', blue (left) with '1', yellow (right) with '0', and white (bottom) with 'COR'.



# Laboratory Focus

- Safety walk-through
  - Lab coats, gloves, sharps, first-aid, fire extinguisher, proper disposal of different kinds of waste.
- Team selection and station assignment
- Laboratory Notebooks – your record of accomplishment and insurance of reproducibility

# Keeping a lab notebook



- Goal: capture the workflow, both intended and actual.
- Name and Date on the notebook
- Waterproof ink for all notations.
- Leave some pages at the beginning for a table of contents
- Number pages as you go.
- Experiments are recorded in parallel on one page or opposite pages:
  - The plan with detailed notes (what reagents to prepare ahead, for example, or to warm up instruments)
  - What happened while following the plan – actual measurements, source of reagents, observations, loss of attention leading to doubt about a step, etc.
  - Explanations of outcomes *as the process occurs*
- Make time at the end of the day to summarize results and observations, recommendations for the next lab, then initial the page.
- Do not skip pages
- Common solution recipes and calculation pages can go in an appendix