

MATERIAL SAFETY DATA SHEET

Perchloric Acid

SECTION 1 . Product and Company Identification

Product Name and Synonym: Perchloric Acid
Product Code: 6603
Material Uses:
Manufacturer: Science Stuff
1104 Newport Ave
Austin, TX 78753
(512) 837-6020
Entry Date : 6/13/2013
Print Date: 6/13/2013
24 Hour Emergency Assistance : Chemtrec 800-424-9300
Canutec 613-996-6666

Health:	2
Flammability:	2
Reactivity:	1

Hazard Rating:
Least Slight Moderate High Extreme
0 1 2 3 4

NA=Not Applicable NE=Not Established

SECTION 2 HAZARD IDENTIFICATION

Causes severe irritation and burns. May Be harmful if swallowed. Avoid breathing vapor or dust. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

Physical state: Liquid

Odor: Vinegar-like

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview: WARNING!
POISON

HARMFUL IF INHALED OR SWALLOWED.
CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
LUNGS, RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA, TEETH.
FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.

Do not ingest. Avoid contact with skin and clothing. Avoid breathing vapor or mist. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Routes of entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eyes: Irritating to eyes.

Skin: Irritating to skin.

Inhalation: Toxic by inhalation. Irritating to respiratory system.

Ingestion: Toxic if swallowed.

Carcinogenic effects: No known significant effects or critical hazards.

Mutagenic effects: No known significant effects or critical hazards.

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Teratogenicity/Reproductive toxicity: No known significant effects or critical hazards.

Medical conditions: Repeated skin exposure can produce local skin destruction or dermatitis. Repeated or prolonged exposure to the substance can produce lung damage. Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to the substance can produce target organs damage.

See toxicological information (section 11)

SECTION 3 MIXTURE COMPONENTS

SARA 313	Component	CAS Number	Percent Comp.	Dimension	Exposure Limits
<input type="checkbox"/>	Acetic Acid, Glacial	CAS# 64-19-7	Balance	V/V	10 ppm OSHA TWA, 15 ppm OSHA STEL
<input type="checkbox"/>	Acetic Anhydride	CAS# 108-24-7	<0.5%	V/V	5 ppm (20 mg/mf) OSHA TWA
<input type="checkbox"/>	Perchloric Acid 70% w/w	CAS#: 7601-90-3	0.14%	W/V	STEL 3 mg/M3 TWA 1 mg/M3

SECTION 4 FIRST AID MEASURES

Causes severe irritation and burns. May Be harmful if swallowed. Avoid breathing vapor or dust. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

FIRST AID: SKIN: In case of contact, immediately flush skin with water for at least 15 minutes while removing contaminated clothing and shoes. Thoroughly clean clothing and shoes before reuse. If symptoms persist, seek medical attention.

EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen

INGESTION: Get medical attention immediately. Wash out mouth with water. Move exposed person to fresh air. If exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel.

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

SECTION 5 FIRE FIGHTING MEASURES

Fire Extinguisher Type:	Carbon Dioxide, dry chemical powder or appropriate foam
Fire / Explosion Hazards:	Vapor may travel considerable distance to source of ignition and flash back.
Fire Fighting Procedure:	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Absorb spill with inert material, then place in a chemical waste container. Neutralize with a weak base.

Personal precautions: Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment. Do not touch or walk through spilled

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material.

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up: If emergency personnel are unavailable, contain spilled material. For small spills, add absorbent (soil may be used in the absence of other suitable materials), scoop up material and place in a sealable, liquid-proof container for disposal. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

SECTION 7 HANDLING AND STORAGE

Handling: Do not ingest. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Avoid breathing vapor or mist. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilation, lighting and material handling) equipment. Wash thoroughly after handling.

Storage: Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory Protection: Organic Vapor Cartridge

Ventilation

Local Exhaust

Mechanical

Protective Gloves: NIOSH Approved Gloves

Eye Protection: Splash Goggles

Other Protective Equipment: Wear appropriate clothing to prevent skin exposure. Use in well ventilated area or use respirator.

Product name - United States

Acetic Acid

Exposure limits

ACGIH TLV (United States, 1/2006).

STEL: 37 mg/m³ 15 minute/minutes. Form: All forms

STEL: 15 ppm 15 minute/minutes. Form: All forms

TWA: 25 mg/m³ 8 hour/hours. Form: All forms

TWA: 10 ppm 8 hour/hours. Form: All forms

NIOSH REL (United States, 12/2001).

STEL: 37 mg/m³ 15 minute/minutes. Form: All forms

STEL: 15 ppm 15 minute/minutes. Form: All forms

TWA: 25 mg/m³ 10 hour/hours. Form: All forms

TWA: 10 ppm 10 hour/hours. Form: All forms

OSHA PEL (United States, 8/1997).

TWA: 25 mg/m³ 8 hour/hours. Form: All forms

TWA: 10 ppm 8 hour/hours. Form: All forms

OSHA PEL 1989 (United States, 3/1989).

TWA: 25 mg/m³ 8 hour/hours. Form: All forms

TWA: 10 ppm 8 hour/hours. Form: All forms

Acetic Anhydride

Exposure limits

ACGIH TLV (United States, 1/2006). Notes: Substances for which the TLV is higher than the OSHA Permissible Exposure Limit (PEL) and/or the NIOSH Recommended Exposure Limit (REL). See CFR 58(124): 36338-33351, June 30, 1993, for revised OSHA PEL.

TWA: 21 mg/m³ 8 hour/hours. Form: All forms

TWA: 5 ppm 8 hour/hours. Form: All forms

NIOSH REL (United States, 12/2001).

CEIL: 20 mg/m³ Form: All forms

CEIL: 5 ppm Form: All forms

OSHA PEL (United States, 8/1997).

TWA: 20 mg/m³ 8 hour/hours. Form: All forms

TWA: 5 ppm 8 hour/hours. Form: All forms

OSHA PEL 1989 (United States, 3/1989).

CEIL: 20 mg/m³ Form: All forms

CEIL: 5 ppm Form: All forms

Consult local authorities for acceptable exposure limits.

Engineering measures: Use only with adequate ventilation. If user operations generate dust, fumes, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

PERSONAL PROTECTION

Eyes: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Recommended: splash goggles

Skin: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Recommended: lab coat

Respiratory: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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Hands: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Recommended: butyl rubber

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Melting Point:	17 Deg C	Percent Volatile by Volume:	100
Boiling Point:	118 Deg C	Evaporation Rate	0.97
Vapor Pressure:	11 mmHg @20 C	Evaporation Standard	
Vapor Density:	2.1 (Air = 1)	Auto Ignition Temp	Not applicable
Solubility in Water:	Soluble	Lower Flamm. Limit in Air	4% @59 deg C (103 F)
Appearance /Odors:	Clear pungent odor liquid (Strong Vinegar smell)	Upper Flamm. Limit in Air	19.3% @93 deg C (199 F)
Flash Point:	39 deg C (103 F) Closed Cup		
Specific Gravity:	1.05		

SECTION 10 STABILITY AND REACTIVITY INFORMATION

Stability:	Stable
Conditions to Avoid:	Material can react violently with strong oxidizing agents, metals, strong bases, amines.
Materials to Avoid:	Oxidizers, strong bases, amines.
Hazardous Decomposition Products:	Oxides of Carbon
Hazardous polymerization:	Not known to occur.

Conditions to Avoid: None known
Stability and reactivity: The product is stable.

Conditions or reactivity: Highly flammable in the presence of the following materials or condition: open flames, sparks, static discharge, heat and shocks and mechanical impacts. Vapor may travel a considerable distance to source of ignition and flash back.

Highly explosive in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and oxidizing materials. Thermal decomposition may release toxic and/or hazardous gases.

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SECTION 11 Toxicological Information

Toxicity data
United States
Product/ingredient name: Acetic Acid

Test	Result	Route	Species
LD50	3310 mg/kg	Oral	Rat
LD50	4960 mg/kg	Oral	Mammal
LD50	1060 mg/kg	Dermal	Mammal
LDLo	600 mg/kg	Oral	Rabbitt
LDLo	600 mg/kg	Oral	Rabbitt
LC50	5620 ppm (1 hour/hours)	Inhalation	Muskrat

Product/Ingredient name: Acetic Anhydride

Test	Result	Route	Species
LD50	1780 mg/kg (4 hour/hours)	Oral	Rat
LC50	1000 ppm (4 hour/hours)	Inhalation	Rat

Chronic effects on humans: Contains material which causes damage to the following organs: lungs, upper respiratory tract, skin, eye, lens or cornea, teeth.

Other toxic effects on humans: Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive), of ingestion.

Specific effects

Carcinogenic effects: No known significant effects or critical hazards.

Mutagenic effects: No known significant effects or critical hazards.

Teratogenicity/Reproductive toxicity: No known significant effects or critical hazards.

Sensitization

Ingestion: No known significant effects or critical hazards.

Inhalation: Irritating to respiratory system.

Eyes: Irritating to eyes.

Skin: Irritating to skin.

SECTION 12 Ecological Information

Ecotoxicity data - United States

Product/ingredient name: Acetic Acid

Species	Period	Result
Daphnia magna (EC50)	48 hour/hours	65 mg/l
Lepomis macrochirus (LC50)	96 hour/hours	75 mg/l
Pimephales promelas (LC50)	96 hour/hours	79 mg/l
Pimephales promelas (LC50)	96 hour/hours	88 mg/l

Environmental precaution: No known significant effects or critical hazards.

Products of degradation: These products are carbon oxides (CO, CO2) and water.

Toxicity of the products of biodegradation: The product of degradation are as toxic as the product itself.

SECTION 13 Disposal Considerations

Waste disposal: The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains, and sewers. Disposal of this product, solutions and any by-products should at all times comply

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with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

SECTION 14 Transport Information

DOT Classification: UN2920, Corrosive Liquid, Flammable, n.o.s.
(Acetic Acid), 8 (3), PG II

DOT Regulations may change from time to time. Please consult the most recent D.O.T. regulations.

SECTION 15 Regulatory Information

United States

HCS Classification: Flammable liquid
Toxic material
Irritating material
Target organ effects

U.S. Federal regulations: TSCA 8(b) inventory: Listed

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: Acetic Anhydride; Acetic Acid

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Perchloric Acid 0.1000N in Acetic Acid: Immediate (acute) health hazard

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: Acetic Anhydride; Acetic Acid

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

Canada

WHMIS (Canada):

Class B-2: Flammable Liquid

Class D-2B: Material causing other toxic effects (Toxic).

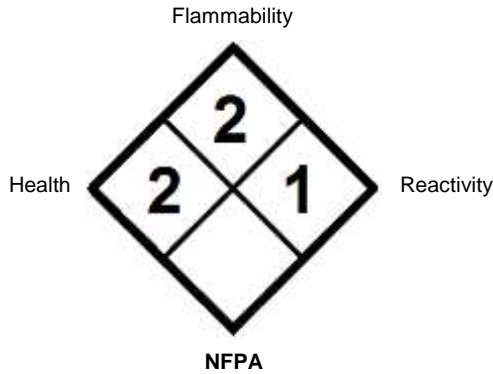
Class E: Corrosive material

CEPA DSL/CEPA NDSL: CEPA DSL: Acetic Anhydride, Acetic Acid

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

SECTION 16 Additional Information

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Revisions

6/9/2000	0	Creation date for msds. STN
3/4/2009	0.1	updated msds with current information. STN
10/12/2011	0.2	Revised DOT from Corrosive Liquid, n.o.s., (Acetic Acid), 8, UN1760, PG II to Corrosive liquids, flammable, n.o.s. (Acetic acid), 8, (3), UN2920, PG II. Also updated to 16 section msds. LS

The information herein is believed to be accurate and is offered in good faith for the user's consideration and investigation. No warranty either expressed or implied is made for the completeness or accuracy of the information whether originating from the above mentioned company or not. Users of this material should satisfy themselves by independent investigation of current scientific and medical knowledge that the material can be used safely.