Perchloric Acid, 0.1N (0.1M) in Glacial Acetic Acid
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Date of issue: 12/16/2013  Version: 1.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product form : Mixture
Product name : Perchloric Acid, 0.1N (0.1M) in Glacial Acetic Acid
Product code : LC18100

1.2. Relevant identified uses of the substance or mixture and uses advised against
Use of the substance/mixture : For laboratory and manufacturing use only.

1.3. Details of the supplier of the safety data sheet
LabChem Inc
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court
Zelienople, PA 16063 - USA
T 412-826-5230 - F 724-473-0647
info@labchem.com - www.labchem.com

1.4. Emergency telephone number
Emergency number : CHEMTREC: 1-800-424-9300 or 011-703-527-3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
GHS-US classification
Flam. Liq. 3 H226
Skin Corr. 1B H314
Eye Dam. 1 H318
Aquatic Acute 3 H402

2.2. Label elements
GHS-US labelling
Signal word (GHS-US) : Danger
Hazard pictograms (GHS-US) :

H226 - Flammable liquid and vapour
H314 - Causes severe skin burns and eye damage
H402 - Harmful to aquatic life

Precautionary statements (GHS-US) :
P210 - Keep away from heat, sparks, open flames, hot surfaces. - No smoking
P233 - Keep container tightly closed
P240 - Keep container properly closed and in a well-ventilated place
P241 - Use explosion-proof electrical, ventilating, lighting equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P260 - Do not breathe mist, vapours, spray
P264 - Wash exposed skin thoroughly after handling
P273 - Avoid release to the environment
P280 - Wear protective gloves, eye protection
P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/physician
P363 - Wash contaminated clothing before reuse
P370+P378 - In case of fire: Use dry chemical or carbon dioxide (CO2), powder, alcohol-resistant foam for extinguishment
P403+P235 - Store in a well-ventilated place. Keep cool
Perchloric Acid, 0.1N (0.1M) in Glacial Acetic Acid
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P405 - Store locked up
P501 - Dispose of contents/container to comply with local, state and federal regulations

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

Full text of H-phrases: see section 16

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic Acid</td>
<td>(CAS No) 64-19-7</td>
<td>97.04</td>
<td>Flam. Liq. 3, H226, Skin Corr. 1B, H314, Eye Dam. 1, H318</td>
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<tr>
<td>Perchloric Acid, 70% w/w</td>
<td>(CAS No) 7601-90-3</td>
<td>0.86</td>
<td>Acute Tox. 4 (Oral), H302, Skin Corr. 1B, H314, Eye Dam. 1, H318</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

First-aid measures after skin contact : Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a POISON CENTER or doctor/physician.

First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Causes severe skin burns and eye damage.

Symptoms/injuries after eye contact : Causes serious eye damage.

4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

SECTION 5: Firefighting measures

5.1. Extinguishing media


Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Flammable liquid and vapour.

Explosion hazard : May form flammable/explosive vapour-air mixture.

Reactivity : Thermal decomposition generates : Corrosive vapours.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Avoid (reject) fire-fighting water to enter environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.
SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Remove ignition sources. Use special care to avoid static electric charges. No naked lights. No smoking.

6.1.1. For non-emergency personnel
Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders
Protective equipment: Equip cleanup crew with proper protection.
Emergency procedures: Ventilate area.

6.2. Environmental precautions
Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up
Methods for cleaning up: Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

6.4. Reference to other sections
See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Additional hazards when processed: Handle empty containers with care because residual vapours are flammable.
Precautions for safe handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour. No naked lights. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. Do not breathe mist, vapours, spray.
Hygiene measures: Wash exposed skin thoroughly after handling. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities
Technical measures: Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting/… equipment. Comply with applicable regulations.
Storage conditions: Keep only in the original container in a cool, well ventilated place away from: Heat sources., Ignition sources. Keep container tightly closed.
Incompatible products: Strong oxidizers. metals. Strong bases.
Incompatible products: Sources of ignition. Direct sunlight. Heat sources.

7.3. Specific end use(s)
No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

| Acetic Acid (64-19-7) |  |
|----------------------|--|---|
| USA ACGIH            | ACGIH TWA (ppm) | 10 ppm |
| USA ACGIH            | ACGIH STEL (ppm) | 10 ppm |
| USA OSHA             | OSHA PEL (TWA) (mg/m³) | 25 mg/m³ |
| USA OSHA             | OSHA PEL (TWA) (ppm) | 10 ppm |

| Acetic Anhydride (108-24-7) |  |
|-------------------------------|--|---|
| USA ACGIH                     | ACGIH TWA (mg/m³) | 4 mg/m³ |
| USA ACGIH                     | ACGIH TWA (ppm) | 1 ppm |
| USA ACGIH                     | ACGIH Ceiling (ppm) | 3 ppm |
| USA OSHA                      | OSHA PEL (TWA) (mg/m³) | 20 mg/m³ |
| USA OSHA                      | OSHA PEL (TWA) (ppm) | 5 ppm |
### 8.2. Exposure controls

**Appropriate engineering controls**: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

**Personal protective equipment**: Avoid all unnecessary exposure.

**Hand protection**: Wear protective gloves.

**Eye protection**: Chemical goggles or face shield.

**Skin and body protection**: Wear suitable protective clothing.

**Respiratory protection**: Wear appropriate mask.

**Other information**: Do not eat, drink or smoke during use.

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### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>Colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>Vinegar odour</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
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<tr>
<td>Relative evaporation rate (butylacetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
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</tr>
<tr>
<td>Freezing point</td>
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</tr>
<tr>
<td>Boiling point</td>
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<tr>
<td>Flash point</td>
<td>40 °C Not applicable</td>
</tr>
<tr>
<td>Self ignition temperature</td>
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<tr>
<td>Decomposition temperature</td>
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<td>Flammability (solid, gas)</td>
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<tr>
<td>Vapour pressure</td>
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<tr>
<td>Relative vapour density at 20 °C</td>
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<tr>
<td>Density</td>
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<tr>
<td>Solubility</td>
<td>Soluble in water</td>
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<td>Log Pow</td>
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<td>Oxidising properties</td>
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<tr>
<td>Explosive limits</td>
<td>No data available</td>
</tr>
</tbody>
</table>

#### 9.2. Other information

No additional information available

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### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

Thermal decomposition generates: Corrosive vapours.

#### 10.2. Chemical stability

Flammable liquid and vapour. May form flammable/explosive vapour-air mixture.

#### 10.3. Possibility of hazardous reactions

Reacts violently with (some) bases: release of heat.

#### 10.4. Conditions to avoid


#### 10.5. Incompatible materials

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10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Not classified

Perchloric Acid, 0.1N (0.1M) in Glacial Acetic Acid
LD50 oral rat 3141 mg/kg

Perchloric Acid, 70% w/w (7601-90-3)
LD50 oral rat 1100 mg/kg

Acetic Anhydride (108-24-7)
LD50 oral rat 1780 mg/kg
LD50 dermal rabbit 4000 mg/kg
LC50 inhalation rat (mg/l) 4.25 mg/l/4h
ATE (oral) 500.000 mg/kg bodyweight
ATE (gases) 4500.000 ppmV/4h
ATE (vapours) 11.000 mg/l/4h
ATE (dust,mist) 1.500 mg/l/4h

Skin corrosion/irritation: Causes severe skin burns and eye damage.
Serious eye damage/irritation: Causes serious eye damage.
Respiratory or skin sensitisation: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified
Reproductive toxicity: Not classified
Specific target organ toxicity (single exposure): Not classified
Specific target organ toxicity (repeated exposure): Not classified
Aspiration hazard: Not classified

Potential Adverse human health effects and symptoms: Based on available data, the classification criteria are not met.
Symptoms/injuries after eye contact: Causes serious eye damage.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - water: Harmful to aquatic life.

Acetic Anhydride (64-19-7)
LC50 fishes 1 75 mg/l (96 h; Lepomis macrochirus)
EC50 Daphnia 1 47 mg/l (24 h; Daphnia magna; Not neutralized)
EC50 other aquatic organisms 1 > 5000 mg/l (5 h; Activated sludge)
LC50 fish 2 94 mg/l (96 h; Oryzias latipes)
EC50 Daphnia 2 95 mg/l (24 h; Daphnia magna; Static system)
TLM fish 1 100 ppm (96 h; Carassius auratus)
Threshold limit algae 1 90 mg/l (192 h; Microcystis aeruginosa; Neutralized)
Threshold limit algae 2 4000 mg/l (192 h; Scenedesmus quadricauda; Neutralized)

Perchloric Acid, 70% w/w (7601-90-3)
LC50 fishes 1 2000 mg/l (96 h; Pisces; Pure substance)

12.2. Persistence and degradability

Perchloric Acid, 0.1N (0.1M) in Glacial Acetic Acid
Persistence and degradability: Not established.
**Bioaccumulative potential**

**Perchloric Acid, 0.1N (0.1M) in Glacial Acetic Acid**

Bioaccumulative potential: Not established.

**Acetic Acid (64-19-7)**

Log Pow: -0.31 (Experimental value)

Bioaccumulative potential: Bioaccumulation: not applicable.

**Perchloric Acid, 70% w/w (7601-90-3)**

BCF fish 1: <= 1 (Pisces; Pure substance)

Log Pow: -4.63 (Estimated value)

Bioaccumulative potential: Not bioaccumulative.

**Mobility in soil**

**Acetic Acid (64-19-7)**

Surface tension: 0.028 N/m (20 °C)

**Perchloric Acid, 70% w/w (7601-90-3)**

Surface tension: 0.07 N/m (25 °C)

**Other adverse effects**

Other information: Avoid release to the environment.

**SECTION 13: Disposal considerations**

**13.1. Waste treatment methods**

Waste disposal recommendations: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to comply with local, state and federal regulations.

Additional information: Handle empty containers with care because residual vapours are flammable.

**SECTION 14: Transport information**

In accordance with DOT

- Transport document description: UN2789 Acetic acid solution (with more than 80 percent acid, by mass), 8, II
- UN-No.(DOT): 2789
- DOT NA no.: UN2789
- DOT Proper Shipping Name: Acetic acid solution with more than 80 percent acid, by mass
- Department of Transportation (DOT) Hazard Classes: 8 - Class 8 - Corrosive material 49 CFR 173.136
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| Hazard labels (DOT) | : 8 - Corrosive substances  
|: 3 - Flammable liquids |

Packing group (DOT): II - Medium Danger

DOT Special Provisions (49 CFR 172.102):
- A3 - For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packagings.
- A6 - For combination packagings, if plastic inner packagings are used, they must be packed in tightly closed metal receptacles before packing in outer packagings.
- A7 - Steel packagings must be corrosion-resistant or have protection against corrosion.
- A10 - When aluminum or aluminum alloy construction materials are used, they must be resistant to corrosion.
- B2 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks are not authorized.
- IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized.
- T7 - 4 178.274(d)(2) Normal............. 178.275(d)(3)
- TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = 95 / (1 + a (tr - tf)) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: a = (d15 - d50) / 35*d50 Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively.

DOT Packaging Exceptions (49 CFR 173.xxx) : 154
DOT Packaging Non Bulk (49 CFR 173.xxx) : 202
DOT Packaging Bulk (49 CFR 173.xxx) : 243
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 1 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 30 L
DOT Vessel Stowage Location : A - The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel.

Additional information
Other information : No supplementary information available.

ADR
Transport document description :

Transport by sea
No additional information available

Air transport
No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

<table>
<thead>
<tr>
<th>Perchloric Acid, 0.1N (0.1M) in Glacial Acetic Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARA Section 311/312 Hazard Classes</td>
</tr>
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<table>
<thead>
<tr>
<th>Acetic Acid (64-19-7)</th>
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</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
<tr>
<td>RQ (Reportable quantity, section 304 of EPA's List of Lists) : 5000 lb</td>
</tr>
</tbody>
</table>

12/16/2013
EN (English)
**Perchloric Acid, 0.1N (0.1M) in Glacial Acetic Acid**

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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<thead>
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<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
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<tbody>
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<td>5000 lb</td>
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### 15.2. International regulations

**CANADA**

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<th>Perchloric Acid, 0.1N (0.1M) in Glacial Acetic Acid</th>
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<tbody>
<tr>
<td>WHMIS Classification</td>
</tr>
<tr>
<td>Class E - Corrosive Material</td>
</tr>
<tr>
<td>Class B Division 3 - Combustible Liquid</td>
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</tbody>
</table>

<table>
<thead>
<tr>
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</table>

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<thead>
<tr>
<th>Perchloric Acid, 70% w/w (7601-90-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the Canadian DSL (Domestic Sustances List) inventory.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WHMIS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class C - Oxidizing Material</td>
</tr>
<tr>
<td>Class E - Corrosive Material</td>
</tr>
</tbody>
</table>

**EU-Regulations**

No additional information available

**Classification according to Regulation (EC) No. 1272/2008 [CLP]**

**Classification according to Directive 67/548/EEC or 1999/45/EC**

Not classified

### 15.2. National regulations

**Perchloric Acid, 70% w/w (7601-90-3)**

Listed on the Canadian Ingredient Disclosure List

### 15.3. US State regulations

No additional information available

**SECTION 16: Other information**

Other information : None.

Full text of H-phrases: see section 16:

- **Acute Tox. 4 (Inhalation:dust,mist)**: Acute toxicity (inhalation:dust,mist) Category 4
- **Acute Tox. 4 (Oral)**: Acute toxicity (oral), Category 4
- **Aquatic Acute 3**: Hazardous to the aquatic environment — AcuteHazard, Category 3
- **Eye Dam. 1**: Serious eye damage/eye irritation, Category 1
- **Flam. Liq. 3**: Flammable liquids, Category 3
- **Skin Corr. 1B**: Skin corrosion/irritation, Category 1B
- **H226**: Flammable liquid and vapour
- **H302**: Harmful if swallowed
- **H314**: Causes severe skin burns and eye damage
- **H318**: Causes serious eye damage
- **H332**: Harmful if inhaled
- **H402**: Harmful to aquatic life
NFPA health hazard: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA fire hazard: 2 - Must be moderately heated or exposed to relatively high temperature before ignition can occur.

NFPA reactivity: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

**HMIS III Rating**

Health: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability: 2 Moderate Hazard

Physical: 0 Minimal Hazard

Personal Protection: H

**SDS US (GHS HazCom 2012)**

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