SAFETY DATA SHEET
Formic Acid 88%
This MSDS is valid for all grades that start with catalog number 283

1. IDENTIFICATION OF SUBSTANCE / MIXTURE AND OF SUPPLIER

Product Identifier: High Purity Chemicals
Synonyms: Hydrogen carboxylic acid; Methanoic acid; Aminic acid; Formylic acid
Other means of identification: CAS No. 64-18-6
EINECS No. 200-579-1

Recommended use of the chemical and restrictions on use:
Commonly used as a preservative.

Supplier Details:
Pharmco Products, Inc.
1101 Isaac Shelby Drive, Shelbyville, KY 40065, USA.
Tel: 502.232.7600
Fax: 502.633.6100
CCN17213

Pharmco Products, Inc.
58 Vale Road, Brookfield, CT 06804, USA.
Tel: 203.740.3471
Fax: 203.740.3481
CCN17213

Emergency Contact: CHEMTREC: 1.800.424.9300 (USA) / +1.703.527.3887 (International)

2. HAZARDS IDENTIFICATION

OSHA Hazards: Combustible liquid, target organ effect, corrosive, Harmful by ingestion

Target Organs: Blood, Central nervous system, Kidney, Liver
NFPA

GHS label elements, including precautionary statements

Signal Word:
DANGER!

Hazard statement(s)
H226 Flammable liquid and vapor
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H331 Toxic if inhaled
H402 Harmful to aquatic life.

Precautionary statement(s)
P261 Avoid breathing dust/fumes/gas/mist/vapors.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical attention.
P310 Immediately call a POISON CENTER or doctor/physician.
P280 Wear protective gloves and eye and face protection.

GHS Classification(s)
Acute aquatic toxicity (Category 3)
Acute Toxicity, Inhalation (Category 3)
Acute toxicity, Oral (Category 4)
Eye damage (Category 1)
Flammable Liquids (Category 3)
Skin corrosion (Category 1B)
Other hazards which do not result in classification:

Potential Health Effects:

<table>
<thead>
<tr>
<th>Organ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>Causes severe eye burns and eye damage</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Harmful if ingested</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Can be harmful if inhaled. Material is corrosive to mucous membranes and the upper respiratory tract.</td>
</tr>
<tr>
<td>Skin</td>
<td>Material is harmful, causing skin burns, if absorbed through the skin.</td>
</tr>
</tbody>
</table>

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Chemical identity: Formic Acid
Common name / Synonym: Hydrogen carboxylic acid; Methanoic acid; Aminic acid; Formylic acid
CAS number: 64-18-6
EINECS number: 200-579-1
ICSC number: 0485
RTECS #: LQ4900000
UN #: 1779
EC #: 607-001-00-0

<table>
<thead>
<tr>
<th>% Weight</th>
<th>Material</th>
<th>CAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>88</td>
<td>Formic Acid</td>
<td>64-18-6</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General advice
Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

Skin
- Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing/shoes.

Inhalation
- Remove person to fresh air. If signs/symptoms continue, get medical attention. Give oxygen or artificial respiration as needed.

Eyes
- Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Keep rinsing while in transport to hospital.

Ingestion
- DO NOT induce vomiting. If vomiting does occur, have victim lean forward to prevent aspiration. Rinse mouth with...
5. FIRE FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media:
   SMALL FIRE: Use dry chemicals, CO2, water spray or alcohol-resistant foam. LARGE FIRE: Use water spray, water fog or alcohol-resistant foam. Cool all affected containers with flooding quantities of water.

Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products):
   Carbon oxides expected to be the primary hazardous combustion product.

Special protective equipment and precautions for firefighters:
   Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Keep unopened containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:
   Wear respiratory protection. Do not inhale vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental precautions:
   Stop leak. Contain spill if possible and safe to do so. Prevent product from entering drains.

Methods and materials for containment and cleaning up:
   Contain spill, then collect with an electrically protected vacuum cleaner or by wet-brushing and put the material into a convenient waste disposal container. Keep container closed.

7. HANDLING AND STORAGE

Precautions for safe handling:
   Do not get on skin or in eyes. Do not inhale vapor or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge.
8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters, e.g., occupational exposure limit values or biological limit values:

<table>
<thead>
<tr>
<th>Component</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formic Acid</td>
<td>US (OSHA)</td>
<td>TWA</td>
<td>5 ppm, 9 mg/m³</td>
<td>29 CFR 1910.1000 Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td>Formic Acid</td>
<td>US (ACGIH)</td>
<td>STEL</td>
<td>10 ppm</td>
<td>ACGIH Threshold Limit Value</td>
</tr>
</tbody>
</table>

Appropriate engineering controls:
General room or local exhaust ventilation is usually required to meet exposure limit(s). Electrical equipment should be grounded and conform to applicable electrical code.

Individual protection measures, such as personal protective equipment:

**Respiratory protection:**
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand 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.

**Eye protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

**Skin and body protection:**
Wear impervious, flame retardant, antistatic protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Hygiene measures:**
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES
**Appearance (physical state, color, etc.)**  
Liquid. Colorless, clear.

**Odor**  
Specific data not available

**Odor threshold**  
Specific data not available

**pH**  
~ 2.2

**Freezing point**  
8.2 - 8.4 °C (46.8 - 47.1 °F)

**Initial boiling point and boiling range**  
101 °C (213 °F)

**Flash point**  
50 °C (122 °F)

**Evaporation rate**  
Specific data not available

**Flammability (solid, gas)**  
Combustible Liquid

**Upper / Lower flammability or explosive limits**  
57% (V) / 18% (V)

**Vapor pressure**  
29.3 hPa (22 mmHg) at 20 °C (68 °F)

**Vapor Density**  
Specific data not available

**Relative Density**  
1.2 g/mL at 25 °C (77 °F)

**Solubility(ies)**  
completely miscible

**Partition coefficient n-octanol/water(ies)**  
log Pow: -0.54

**Auto-ignition temperature**  
434 °C (813 °F)

**Decomposition temperature**  
Specific data not available

**Formula (FORMIC ACID)**  
CH2O2

**Molecular Weight (FORMIC ACID)**  
46.0 g/mol

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### 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Chemical Stability</th>
<th>Stable under recommended storage conditions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possibility of hazardous reactions</td>
<td>No data available</td>
</tr>
<tr>
<td>Conditions to avoid (e.g., static discharge, shock or vibration)</td>
<td>Heat, flames, and sparks.</td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>Strong oxidizing agents, Strong bases, Powdered metals</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Carbon oxides are expected to be, under fire conditions, the primary hazardous decomposition products.</td>
</tr>
</tbody>
</table>

### 11. TOXICOLOGICAL INFORMATION

- Formic Acid 64-18-6

**Product Summary:**  
No data available for the mutagenic, teratogenic, or reproductive effects of the product. No data available to designate product as an aspiration hazard or to cause specific target organ toxicity through single or repeated exposure.

**Acute Toxicity:**

<table>
<thead>
<tr>
<th>LC50 (Inhalation)</th>
<th>Rat</th>
<th>7.4 mg/L</th>
<th>4 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 (Oral)</td>
<td>Rat</td>
<td>1,100 mg/kg</td>
<td></td>
</tr>
</tbody>
</table>

**MSDS:** 270  
**Revision Date:** 12.17.13  
**Revision Number:** 3.0  
**Initials:** MW
Irritation:
   Eyes
   Rabbit - severe eye irritation/damage - 6 hours

Respiratory/Skin sensitization
   Prolonged/repeated exposure may cause allergic reactions in certain sensitive individuals.

Skin
   Rabbit - severe skin irritation

Carcinogenicity
   IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable or confirmed human carcinogen by IARC.
   ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
   NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
   OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Other Hazards

<table>
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<tr>
<th>Organ</th>
<th>Description</th>
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<td>Causes skin burns or skin damage.</td>
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</table>

12. ECOLOGICAL INFORMATION

- Formic Acid 64-18-6

Ecotoxicity (aquatic and terrestrial, where available):
Acute Fish Toxicity (FORMIC ACID)
LC50 / 96 hours Golden Orfe - 46-100 mg/L

Toxicity to Daphnia (FORMIC ACID)
EC50 / 48 hours Water flea - 34 mg/L
Persistence and degradability:
Readily biodegradable.

Bioaccumulative potential:
Biaccumulation is unlikely

Other adverse effects:
Can be considered an environmental hazard through improper handling or improper disposal.

13. DISPOSAL CONSIDERATIONS
Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging:
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

14. TRANSPORT INFORMATION
Description of waste residues and information on their safe handling and methods of disposal:

<table>
<thead>
<tr>
<th>UN number</th>
<th>1779</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>Formic Acid</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>8 (3)</td>
</tr>
<tr>
<td>Packing group (if applicable)</td>
<td>II</td>
</tr>
</tbody>
</table>

Reportable Quantity
5,000 lbs

IMDG
UN-Number: 1779 Class: 8 (3) Packing Group: II
EMS-No: F-E, S-C
Proper shipping name: FORMIC ACID
Marine pollutant: No

IATA
UN-Number: 1779 Class: 8 (3) Packing Group: II
Proper shipping name: Formic Acid

15. REGULATORY INFORMATION
Safety, health and environmental regulations specific for the product in question:
OSHA Hazards
Combustible liquid, target organ effect, corrosive, Harmful by ingestion
All ingredients are on the following inventories or are exempted from listing

<table>
<thead>
<tr>
<th>Country</th>
<th>Notification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>AICS</td>
</tr>
<tr>
<td>Canada</td>
<td>DSL</td>
</tr>
<tr>
<td>China</td>
<td>IECS</td>
</tr>
<tr>
<td>European Union</td>
<td>EINECS</td>
</tr>
<tr>
<td>Japan</td>
<td>ENCS/ISHL</td>
</tr>
<tr>
<td>Korea</td>
<td>ECL</td>
</tr>
<tr>
<td>New Zealand</td>
<td>NZIoC</td>
</tr>
<tr>
<td>Philippines</td>
<td>PICCS</td>
</tr>
<tr>
<td>United States of America</td>
<td>TSCA</td>
</tr>
</tbody>
</table>

**SARA 302 Components**
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**
The following components are subject to reporting levels established by SARA Title III, Section 313: FORMIC ACID CAS-No. 64-18-6 Revision Date 2007-07-01

**SARA 311/312 Hazards**
Acute Health Hazard  
Chronic Health Hazard  
Fire Hazard

**CERCLA**
Formic Acid CAS-No. 64-18-6, RQ: 5,000 lbs

**Massachusetts Right To Know Components**
Formic acid CAS-No. 64-18-6 Revision Date 2007-07-01

**Pennsylvania Right To Know Components**
Formic acid CAS-No. 64-18-6 Revision Date 2007-07-01

Water CAS-No. 7732-18-5

**New Jersey Right To Know Components**
Formic acid CAS-No. 64-18-6 Revision Date 2007-07-01

Water CAS-No. 7732-18-5
California Prop 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION:
INCLUDING INFORMATION ON PREPARATION AND REVISION OF THE SDS

Disclaimer
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