



DUDA ENERGY LLC

Safety Data Sheet FORMIC ACID 95%

SECTION 1: Identification

1.1 Product identifier

| | |
|----------------|-----------------|
| Product name | FORMIC ACID 95% |
| Product number | Not available |
| Brand | N/A |
| Substance name | FORMIC ACID |
| EC no. | 200-579-1 |
| CAS no. | 64-18-6 |
| Index no. | 607-001-00-0 |

1.2 Other means of identification

None

1.3 Recommended use of the chemical and restrictions on use

Decalcifier; wool dye reducer; depilatory for hides and tanning; rubber regeneration; electroplating; silage and grain preservation; reactive alkylating agent for alcohols; carboxylating agent for tertiary compounds; dyeing and finishing of textiles; manufacture of fumigants; insecticides; refrigerants; solvents of perfume; lacquers; acetic acid; airplane dope; allyl alcohol; cellulose formate; phenolic resins and oxalate; brewing (antiseptic); ore floatation; vinyl resin plasticizers; counterirritant; astringent; laundry and paper industries.

1.4 Supplier's details

| | |
|-----------|---|
| Name | Duda Energy LLC |
| Address | 1112 Brooks St. Decatur, AL 35601 USA |
| Telephone | 256.340.4866 |
| Fax | N/A |
| email | N/A |

1.5 Emergency phone number(s)

800.255.3924 (Chemtel)

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with: (US) OSHA (29 CFR 1910.1200)

- Flammable liquids (chapter 2.6), Cat. 3
- Acute toxicity, oral (chapter 3.1), Cat. 4
- Acute toxicity, inhalation (chapter 3.1), Cat. 3
- Skin corrosion/irritation (chapter 3.2), Cat. 1A
- Eye damage/irritation (chapter 3.3), Cat. 1

2.2 GHS label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

| | |
|------|---|
| H226 | Flammable liquid and vapor |
| H302 | Harmful if swallowed |
| H314 | Causes severe skin burns and eye damage |
| H318 | Causes serious eye damage |
| H331 | Toxic if inhaled |

Precautionary statement(s)

| | |
|----------------|---|
| P210 | Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking. |
| P233 | Keep container tightly closed. |
| P240 | Ground/bond container and receiving equipment. |
| 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 dust/fume/gas/mist/vapours/spray. |
| P261 | Avoid breathing dust/fume/gas/mist/vapours/spray. |
| P264 | Wash ... thoroughly after handling. |
| P270 | Do not eat, drink or smoke when using this product. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P301+P312 | IF SWALLOWED: Call a POISON CENTER/doctor/.../if you feel unwell, |
| P301+P330+P331 | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |
| P303+P361+P353 | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. |
| P304+P340 | IF INHALED: Remove person to fresh air and keep 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/doctor/... |

| | |
|-----------|--|
| P311 | Call a POISON CENTER/doctor/... |
| P321 | Specific treatment (see ... on this label). |
| P330 | Rinse mouth. |
| P363 | Wash contaminated clothing before reuse. |
| P370+P378 | In case of fire: Use ... to extinguish. |
| P403+P233 | Store in a well ventilated place. Keep container tightly closed. |
| P403+P235 | Store in a well ventilated place. Keep cool. |
| P405 | Store locked up. |
| P501 | Dispose of contents/container to ... |

2.3 Other hazards which do not result in classification

Corrosive to the respiratory tract.

SECTION 3: Composition/information on ingredients

3.1 Substances

| | |
|--------------------------------------|---------------|
| Substance name | FORMIC ACID |
| EC no. | 200-579-1 |
| CAS no. | 64-18-6 |
| Index no. | 607-001-00-0 |
| Formula | CH2O2 |
| Molecular weight | 46.02 |
| Other names / synonyms | UN1779 |
| Impurities and stabilizing additives | Not available |

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

| | |
|-------------------------|--|
| General advice | Be aware of the risk of exposure to material when providing first aid. |
| If inhaled | IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Respirator Recommendation. |
| In case of skin contact | IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. IMMEDIATELY call a hospital or poison control center even if no symptoms (such as redness or irritation) develop. IMMEDIATELY transport the victim to |

a hospital for treatment after washing the affected areas.

In case of eye contact

First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

If swallowed

DO NOT INDUCE VOMITING. Corrosive chemicals will destroy the membranes of the mouth, throat, and esophagus and, in addition, have a high risk of being aspirated into the victim's lungs during vomiting which increases the medical problems. If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and IMMEDIATELY call a hospital or poison control center. IMMEDIATELY transport the victim to a hospital. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. Transport the victim IMMEDIATELY to a hospital.

Personal protective equipment for first-aid responders
Not available

4.2 Most important symptoms/effects, acute and delayed

Symptoms resulting from exposure to this compound include severe irritation of skin, eyes, and mucous membranes; lacrimation, increased nasal discharge, cough, throat discomfort, erythema and blistering. Others symptoms usually associated only with ingestion include salivation, vomiting, burning sensation in mouth, bloody vomiting, diarrhea, nausea and pain. In severe poisoning shock may occur, followed by breathing difficulties and kidney damage [346]. It may cause severe burns [025]. Other symptoms include albuminuria and hematuria [031]. It can also cause local necrosis [151]. Signs of fatal poisoning are decreased pulse rate and respiration; drop in blood pressure, cyanosis and ultimately death [053].

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Not available

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Specific hazards arising from the chemical

Carbon oxides

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

Further information

Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Minimize risk of exposure to material;

Means: PPE (chemical resistant gloves, respirator with full face shield, etc), safe handling practices, good industrial hygiene.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

If you should spill this chemical, use absorbent paper to pick up all liquid spill material. Seal the absorbent paper, as well as any of your clothing which may be contaminated, in a vapor-tight plastic bag for eventual disposal. Wash any surfaces you may have contaminated with a soap and water solution. Do not reenter the contaminated area until the Safety Officer (or other responsible person) has verified that the area has been properly cleaned.

Reference to other sections

For disposal, see Section 13

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Keep away from sources of ignition. Take measures to prevent build up of electrostatic charge.

No smoking.

7.2 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.

Vent periodically. Handle and open container with care.

Hygroscopic.

Storage class (TRGS 510): Flammable liquids

Specific end use(s)

Apart from the uses mentioned in section 1, no other uses are specified.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

1. Formic acid (CAS: 64-18-6)

REL (Inhalation): 5 ppm (NIOSH)

OSHA Annotated Table Z-1, www.osha.gov

2. Formic acid (CAS: 64-18-6)

PEL (Inhalation): 5 ppm, (ST) 10 ppm (Cal/OSHA)
OSHA Annotated Table Z-1, www.osha.gov

3. Formic acid (CAS: 64-18-6)

PEL (Inhalation): 9 mg/m³ (OSHA)
OSHA Annotated Table Z-1, www.osha.gov

4. Formic acid (CAS: 64-18-6)

PEL (Inhalation): 5 ppm (OSHA)
OSHA Annotated Table Z-1, www.osha.gov

8.2 Appropriate engineering controls

Avoid contact with skin, eyes, and clothing. Washing hands before breaks and immediately after handling the product.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

*MINIMUM PROTECTIVE CLOTHING: If Tyvek-type disposable protective clothing is not worn during handling of this chemical, wear disposable Tyvek-type sleeves taped to your gloves. *RECOMMENDED GLOVE MATERIALS: GlovES Expert System Recommended Gloves For Use With Neat (Undiluted) Chemical: This chemical has not been tested for permeation by Radian Corporation; however, the GlovES expert system was used to extrapolate permeation test information from compounds in the same chemical class and the following recommendation(s) are provided. The GlovES system uses permeation data from literature sources; therefore, extra safety margins should be used with the recommended exposure times. If this chemical comes into contact with your glove, or if a tear, puncture or hole develops, remove them at once. Suggested Glove Type Model Number Thickness Estimated Breakthrough Neoprene Edmont 29-840 0.38 mm 360 min. Nitrile Edmont 37-175 0.40 mm 360 min. PVC Edmont PVC Unknown 360 min.

Body protection

Complete suit protecting against chemicals. Flame retardant antistatic protective clothing. The type of PPE must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

*RECOMMENDED RESPIRATOR: When working with this chemical, wear a NIOSH-approved full face positive pressure supplied-air respirator or a self-contained breathing apparatus (SCBA). [651]

Thermal hazards

Not available

Environmental exposure controls

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

| | |
|---|--|
| Appearance/form (physical state, color, etc.) | Liquid |
| Odor | Pungent |
| Odor threshold | Not available |
| pH | 2.2 at 2.2 g/l at 20 °C |
| Melting point/freezing point | 8.4 |
| Initial boiling point and boiling range | 100.7 |
| Flash point | 56 °C |
| Evaporation rate | Not available |
| Flammability (solid, gas) | Not available |
| Upper/lower flammability limits | Not available |
| Upper/lower explosive limits | Upper explosion limit: 57%(V) Lower explosion limit: 18%(V) |
| Vapor pressure | 42.00 hPa (31.50 mmHg) at 20 °C 169.99 hPa (127.50 mmHg) at 50 °C |
| Vapor density | 1.59 - (Air = 1.0) |
| Relative density | 1.220 @ 20 °C [017,042,274,421] |
| Solubility(ies) | completely miscible (Water) |
| Partition coefficient: n-octanol/water | log Pow: -0.54 |
| Auto-ignition temperature | Not available |
| Decomposition temperature | Not available |
| Viscosity | Not available |
| Explosive properties | Not available |
| Oxidizing properties | Not available |

Other safety information

None

SECTION 10: Stability and reactivity

10.1 Reactivity

Not available

10.2 Chemical stability

Stable under recommended storage conditions

10.3 Possibility of hazardous reactions

Not available

10.4 Conditions to avoid

Heat, flames, sparks.

10.5 Incompatible materials

Strong oxidizing agents, Strong bases, Powdered metals.

10.6 Hazardous decomposition products

Not available

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

FORMIC ACID

LD50 Oral - Rat - 730 mg/kg

(OECD Test Guideline 401)

LC50 Inhalation - Rat - 7.4 mg/l - 4 h

Skin corrosion/irritation

Skin - Rabbit

Result: Severe skin irritation

(Draize test)

Serious eye damage/irritation

Eyes - Rabbit

Result: Severe eye irritation

Respiratory or skin sensitization

Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.

Buehler Test - Guinea pig

Result: Did not cause sensitisation on laboratory animals.

(OECD Test Guideline 406)

Germ cell mutagenicity

Not available

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

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.

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.

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.

Reproductive toxicity

Not available

Summary of evaluation of the CMR properties

Not available

STOT-single exposure

Not available

STOT-repeated exposure

Not available

Aspiration hazard

Not available

Additional information

RTECS: LQ4900000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

May cause spasm, inflammation and edema of the larynx; spasm, inflammation and edema of the bronchi; pneumonitis, pulmonary edema, burning sensation, cough, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting. The full properties - chemical, physical, and toxicological, have not been thoroughly investigated.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 - Leuciscus idus (Golden orfe) - 46 - 100 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna (Water flea) - 34.2 mg/l - 48 h

Toxicity to bacteria: EC50 - Pseudomonas putida - 46.7 mg/l - 17 h

Persistence and degradability

Biodegradability - Result: >90% - Readily biodegradable (OECD Test Guideline 301C)

Biochemical Oxygen Demand (BOD) - 86 mg/g

Chemical Oxygen Demand (COD) - 348 mg/g

Ratio BOD/ThBOD - 8.60%

Bioaccumulative potential

Bioaccumulation is unlikely.

Mobility in soil

Not Available

Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

Other adverse effects

Harmful to aquatic life.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

SECTION 13: Disposal considerations

Disposal of the product

Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Disposal of contaminated packaging

Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

Waste treatment

Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.

Sewage disposal

Dispose of in accordance with local regulations.

Other disposal recommendations

Contact a licensed professional waste disposal service to dispose of this material.

SECTION 14: Transport information

DOT (US)

UN Number: UN1779

Class: 8

Packing Group: II

Proper Shipping Name: Formic Acid

Reportable quantity (RQ):

Marine pollutant:

Poison inhalation hazard:

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Pennsylvania Right To Know Components

Chemical name: Formic acid

CAS number: 64-18-6

New Jersey Right To Know Components

Common name: FORMIC ACID

CAS number: 64-18-6

Massachusetts Right To Know Components

Chemical name: Formic acid

CAS number: 64-18-6

15.2 Chemical Safety Assessment

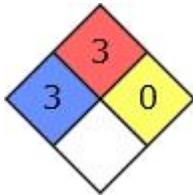
Not available

HMIS Rating

| |
|---------------------|
| FORMIC ACID |
| HEALTH |
| 3 |
| FLAMMABILITY |
| 3 |

| |
|-------------------------|
| PHYSICAL HAZARD 0 |
| PERSONAL PROTECTION |

NFPA Rating



SECTION 16: Other information

None available

16.1 Further information/disclaimer

The information provided in this Safety Data Sheet is correct to the best of Duda Energy LLC's knowledge, information, and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. This Safety Data Sheet only contains information relating to safety and does not replace any product information or product specification. Please note, the content may be changed, corrected, or deleted at any time without notice, and may not always necessarily reflect the most current data. Duda Energy LLC will assume no responsibility for any trouble or failure caused by the errors in the information provided, nor any damage associated with the usage of the information.

16.2 Preparation information

Version: 2
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