

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 04/01/2011 Revision date: 21/06/2019 Supersedes: 25/02/2016 Version: 2.1

DLM-286

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

1.1. Product identifier

Product form : Substance

Substance name : FORMIC ACID-D2 (D, 98%) (<5% D2O)

EC Index-No. : 607-001-00-0 (Unlabeled)

 EC-No.
 : 213-057-3

 CAS-No.
 : 920-42-3

 Product code
 : DLM-286

 Formula
 : DCOOD

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Main use category : Professional use

Industrial/Professional use spec : For professional use only

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Cambridge Isotope Laboratories, Inc.

50 Frontage Road Andover, MA 01810

USA

USA: 1-800-322-1174 Int: 1-978-749-8000 <u>cilsales@isotope.com</u> www.isotope.com

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours) International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Flam. Liq. 3 H226
Acute Tox. 4 (Oral) H302
Acute Tox. 3 (Inhalation) H331
Skin Corr. 1A H314
Eye Dam. 1 H318

Full text of hazard classes and H-statements : see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

C; R35

Full text of R-phrases: see section 16

GHS-US classification

Flam. Liq. 3 H226
Acute Tox. 4 (Oral) H302
Acute Tox. 3 (Inhalation) H331
Skin Corr. 1A H314
Eye Dam. 1 H318
Aquatic Acute 3 H402

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

blood. central nervous system. kidneys. liver. Toxic if inhaled. Harmful if swallowed. Causes severe skin burns and eye damage.

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2.2. **Label elements**

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

Hazard pictograms (CLP)







GHS06

GHS05

Signal word (CLP) : Danger

Hazard statements (CLP) : H226 - Flammable liquid and vapor

H302 - Harmful if swallowed

H314 - Causes severe skin burns and eye damage

H331 - Toxic if inhaled

Precautionary statements (CLP) : 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 P260 - Do not breathe dust, fume, gas, mist, spray, vapors. P264 - Wash hands, forearms and face thoroughly after handling. P270 - Do not eat, drink or smoke when using this product. P271 - Use only outdoors or in a well-ventilated area.

GHS-US labeling

Signal word (GHS-US)

Hazard pictograms (GHS-US)







GHS05

GHS06

: Danger

Hazard statements (GHS-US) : 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 statements (GHS-US)

P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking.

P233 - Keep container tightly closed.

P240 - Ground/Bond container and receiving equipment

P241 - Use explosion-proof electrical, lighting, ventilating equipment

P242 - Use only non-sparking tools.

P243 - Take precautionary measures against static discharge. P260 - Do not breathe dust, fume, gas, mist, spray, vapors.

P261 - Avoid breathing dust, fume, gas, mist, spray, vapors

P264 - Wash hands, forearms and face thoroughly after handling.

P270 - Do not eat, drink or smoke when using this product.

P271 - Use only outdoors or in a well-ventilated area

P273 - Avoid release to the environment.

P280 - Wear eye protection, face protection, protective clothing, protective gloves.

P301+P312 - If swallowed: Call a doctor, a POISON CENTER 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 doctor, a POISON CENTER

P311 - Call a doctor, a POISON CENTER

P321 - Specific treatment (see Hazardous component(s) for labeling on this label)

P330 - Rinse mouth.

P363 - Wash contaminated clothing before reuse.

P370+P378 - In case of fire: Use alcohol resistant foam, carbon dioxide (CO2), dry

extinguishing powder 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 hazardous or special waste collection point, in

accordance with local, regional, national and/or international regulation

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Other hazards

PBT: not relevant - no registration required

SECTION 3: Composition/Information on ingredients

Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
FORMIC ACID-D2 (D, 98%) (<5% D2O)	(CAS-No.) 920-42-3 (EC-No.) 213-057-3 (EC Index-No.) 607-001-00-0 (Unlabeled)	100	C; R35
Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
FORMIC ACID-D2 (D, 98%) (<5% D2O)	(CAS-No.) 920-42-3 (EC-No.) 213-057-3 (EC Index-No.) 607-001-00-0 (Unlabeled)	100	Flam. Liq. 3, H226 Acute Tox. 4 (Oral), H302 Acute Tox. 3 (Inhalation), H331 Skin Corr. 1A, H314 Eye Dam. 1, H318

Full text of R- and H- phrases: see section 16

Name	Product identifier	%	GHS-US classification
FORMIC ACID-D2 (D, 98%) (<5% D2O) (Main constituent)	(CAS-No.) 920-42-3	100	Flam. Liq. 3, H226 Acute Tox. 4 (Oral), H302 Acute Tox. 3 (Inhalation), H331 Skin Corr. 1A, H314 Eye Dam. 1, H318 Aquatic Acute 3, H402

Full text of H-phrases: see section 16

Mixtures

Not applicable

SECTION 4: First aid measures

Description of first aid measures

First-aid measures general

- : If you feel unwell, seek medical advice (show the label where possible). Evacuate danger area.
- First-aid measures after inhalation
- When symptoms occur: go into open air and ventilate suspected area. If not breathing, give artificial respiration. Get medical advice/attention. Remove victim 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
- Wash with plenty of soap and water, Get immediate medical advice/attention, 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

: Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get medical advice/attention. Rinse mouth. Call a POISON CENTER or doctor/physician if you feel unwell. Do NOT induce vomiting. Immediately call a poison center or doctor/physician.

Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation

: Toxic if inhaled. May cause respiratory irritation.

Symptoms/effects after skin contact

Repeated exposure to this material can result in absorption through skin causing significant health hazard. Causes severe skin burns and eye damage.

Symptoms/effects after eye contact

Causes serious eve damage.

Symptoms/effects after ingestion

Swallowing a small quantity of this material will result in serious health hazard. Harmful if

Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media : Water spray. Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2).

5.2 Special hazards arising from the substance or mixture

Fire hazard : Flammable liquid and vapor.

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

Reactivity : Vapors may form flammable mixture with air. Heating may cause an explosion.

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5.3. Advice for firefighters

Firefighting instructions

: Fight fire with normal precautions from a reasonable distance. Wear a self contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.

Protection during firefighting

Do not enter fire area without proper protective equipment, including respiratory protection. Wear recommended personal protective equipment.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

General measures

: Remove ignition sources. Use special care to avoid static electric charges. No open flames. No smoking

6.1.1. For non-emergency personnel

Emergency procedures

: Use personal protective equipment as required. Ensure adequate air ventilation. Avoid breathing vapors, mist, gas. Avoid dust formation. Evacuate unnecessary personnel. Evacuate danger area. Eliminate all ignition sources if safe to do so. No open flames, no sparks, and no smoking. Special attention should be given to low areas/pits where flammable vapors can accumulate.

6.1.2. For emergency responders

Protective equipment

Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

Environmental precautions

Prevent entry to sewers and public waters. Do not allow to enter drains or water courses. Avoid release to the environment.

Methods and material for containment and cleaning up

For containment

Other information

: Collect spillage. Clean up any spills as soon as possible, using an absorbent material to collect it. Small quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal. For large spills, confine the spill in a dike and charge it with wet sand or earth for subsequent safe disposal.

Methods for cleaning up

This material and its container must be disposed of in a safe way, and as per local legislation.

: Dispose of materials or solid residues at an authorized site.

Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

Precautions for safe handling

Additional hazards when processed

: Avoid all eve and skin contact and do not breathe vapor and mist. Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. Handle empty containers with care because residual vapors are flammable.

Precautions for safe handling

: No open flames. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. Do not breathe dust, fume, gas, mist, spray, vapors. Avoid contact during pregnancy/while nursing.

Hygiene measures

Do not eat, drink or smoke when using this product. Wash hands, forearms and face thoroughly after handling.

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 Lighting equipment, ventilating equipment. Comply with applicable regulations.

Storage conditions

Store at room temperature away from light and moisture.

: Heat sources. Incompatible materials

Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. **Control parameters**

FORMIC ACID-D2 (D, 98%) (<5% D2O) (920-42-3)	
Italy - Portugal - USA ACGIH	ACGIH TWA (ppm)	5.00000000 ppm Eye, skin, & Upper Respiratory Tract irritation.
Italy - Portugal - USA ACGIH	ACGIH STEL (ppm)	10 ppm
USA OSHA	OSHA PEL (TWA) (mg/m³)	9 mg/m³

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8.2. Exposure controls

Appropriate engineering controls : Wash hands and other exposed areas with mild soap and water before eating, drinking or

smoking and when leaving work.

Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.



Materials for protective clothing : Wear suitable protective clothing and gloves.

Hand protection : Wear suitable protective clothing and gloves.

Eye protection : Chemical goggles or face shield. Wear eye protection. Chemical goggles or face shield with

safety glasses.

Skin and body protection : Wear suitable protective clothing, gloves and eye/face protection. Wear suitable protective

clothing.

Respiratory protection : In case of inadequate ventilation wear respiratory protection. Approved supplied air respirator.

Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid
Appearance : Liquid

Molecular mass : 48.04 g/mol (Labeled)

Color : Colorless

Odor : No data available
Odor threshold : No data available

pH : 2.2 at 2.2 g/l at 20 °C (68 °F)

Relative evaporation rate (butyl acetate=1) : No data available

Melting point : 8.2 - 8.4 °C (46.8 - 47.1 °F) - lit.

Freezing point : No data available

Boiling point : 100 - 101 °C (212 - 214 °F) - lit. Flash point : 49.5 °C (121.1 °F) - closed cup

Auto-ignition temperature : No data available Decomposition temperature : No data available

Flammability (solid, gas) : Flammable liquid and vapor

Vapor pressure : 42 hPa (31.50 mmHg) at 20 °C (68 °F)

Relative vapor density at 20 $^{\circ}$ C : 1.59 - (Air = 1.0) Relative density : No data available

Specific gravity / density : 1.22 g/ml at 25 °C (77 °F)

Solubility : completely miscible.

Water: Completely miscible

Log Pow : -0.54

Log Kow : No data available
Viscosity, kinematic : No data available
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidizing properties : No data available
Explosion limits : 18 - 57 % (V)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Vapors may form flammable mixture with air. Heating may cause an explosion.

10.2. Chemical stability

Stable if stored under recommended conditions.

10.3. Possibility of hazardous reactions

May form flammable/explosive vapor-air mixture.

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10.4. Conditions to avoid

Open flame. Overheating. Direct sunlight. Heat. Sparks.

10.5. Incompatible materials

Powdered metals. Strong bases. Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbon oxides (CO, CO2). May release flammable gases. Thermal decomposition generates: Corrosive vapors

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed. Inhalation: Toxic if inhaled.

FORMIC ACID-D2 (D, 98%) (<5% D2O) (920-42-3)	
LD50 oral rat	730 mg/kg
LC50 inhalation rat (mg/l)	7.4 mg/l - 4 h
ATE CLP (oral)	1100.000 mg/kg body weight
ATE CLP (gases)	700.000 ppmV/4h
ATE CLP (vapors)	15.000 mg/l/4h
ATE CLP (dust, mist)	0.500 mg/l/4h

Skin corrosion/irritation : Causes severe skin burns and eye damage.

Skin rabbit

Severe skin irritant

pH: 2.2 at 2.2 g/l at 20 °C (68 °F)

Serious eye damage/irritation : Causes serious eye damage.

Eyes rabbit

Causes serious eye irritation

pH: 2.2 at 2.2 g/l at 20 °C (68 °F)

Respiratory or skin sensitization : Exposure may produce an allergic reaction. May cause respiratory irritation

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 : Not classified

exposure

: Not classified

Potential Adverse human health effects and

symptoms

Aspiration hazard

This material or its emissions may aggravate pulmonary/bronchial disease and/or cause breathing difficulty. May cause irritation to the respiratory tract, sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing. Possible laryngeal spasm/edema. Pulmonary edema. Irritation to lungs and upper respiratory tract shown as rhinitis, pharyngitis and pneumonia. Possible lung complication (inflammation, edema). Risk of pneumonia. Shortness of breath. Spasms. Headache. Nausea. Vomiting. This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as quaranteeing any specific property of the product. Wheezing.

Symptoms/effects after inhalation : Toxic if inhaled. May cause respiratory irritation.

Symptoms/effects after skin contact : Repeated exposure to this material can result in absorption through skin causing significant

health hazard. Causes severe skin burns and eye damage.

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

Symptoms/effects after ingestion : Swallowing a small quantity of this material will result in serious health hazard. Harmful if

swallowed.

SECTION 12: Ecological information

12.1. Toxicity

FORMIC ACID-D2 (D, 98%) (<5% D2O) (920-42-3)		
LC50 fish 1	46 - 100 mg/l Leuciscus idus (Golden orfe) - 96 h	
EC50 Daphnia 1	34.2 mg/l Daphnia magna (Water flea) - 48 h	
EC50 other aquatic organisms 1	46.7 mg/l Pseudomomas putida - 17 h	

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12.2. Persistence and degradability

FORMIC ACID-D2 (D, 98%) (<5% D2O) (920-42-3)	
Persistence and degradability	Readily biodegradable.
Biodegradation	> 90 %

12.3. Bioaccumulative potential

FORMIC ACID-D2 (D, 98%) (<5% D2O) (920-42-3)	
Log Pow	-0.54
Bioaccumulative potential	Bioaccumulation unlikely.

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

FORMIC ACID-D2 (D, 98%) (<5% D2O) (920-42-3)

PBT: not relevant - no registration required

12.6. Other adverse effects

Other adverse effects : Environmental precautions. Harmful to aquatic organisms, may cause long-term adverse

effects in the aquatic environment. Disposal must be done according to official regulations.

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste) : Waste materials should be disposed of under conditions which meet Federal, State, and local

environmental control regulations.

Product/Packaging disposal recommendations : Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed

professional waste disposal service to dispose of this material.

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

Ecology - waste materials : Dispose of as unused product.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No.(DOT) : 1779 DOT NA no. UN1779

14.2. UN proper shipping name

Proper Shipping Name (DOT) : Formic acid

Class (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136

Hazard labels (DOT) : 8 - Corrosive

3 - Flammable liquid





Packing group (DOT) : II - Medium Danger

DOT Special Provisions (49 CFR 172.102) : B2 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks are

not authorized.

B28 - Packaging must be made of stainless steel.

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: (image) 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: (image) 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

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DOT Packaging Bulk (49 CFR 173.xxx) : 242

DOT RQ : 5000 lbs

Marine pollutant : No

14.3. Additional information

Emergency Response Guide (ERG) Number : 153

Other information : No supplementary information available.

Overland transport

Packing group (ADR) : II

Class (ADR) : 8 - Corrosive substances

Hazard identification number (Kemler No.) : 83
Classification code (ADR) : CF1

Hazard labels (ADR) : 8 - Corrosive substances

3 - Flammable liquids



Orange plates

83 1779

Tunnel restriction code (ADR) : D/E
Limited quantities (ADR) 11
EAC : •2W
APP : A(fl)
Excepted quantities (ADR) : E2

Transport by sea

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a

passenger vessel.

DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

MFAG-No : 153

Air transport

DOT Quantity Limitations Passenger aircraft/rail : 1 L

(49 CFR 173.27)

DOT Quantity Limitations Cargo aircraft only (49 : 30 L

CFR 175.75)

Civil Aeronautics Law : Corrosive substances

14.4. Environmental hazards

Other information : No supplementary information available.

14.5. Special precautions for user

14.6. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

FORMIC ACID-D2	(D, 98%)	(<5% D2O) (920-42-3)
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Subject to reporting requirements of United States SARA Section 313

SARA Section 302 Threshold Planning
Quantity (TPQ)

Not subject to reporting requirements of the United States SARA Section 302

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FORMIC ACID-D2 (D, 98%) (<5% D2O) (920-42-3)	
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard

15.2. International regulations

CANADA

FORMIC ACID-D2 (D, 98%) (<5% D2O) (920-42-3)

Listed on the Canadian DSL (Domestic Substances List)

National regulations 15.2.1.

No additional information available

15.3. US State regulations

FORMIC ACID-D2 (D, 98%) (<5% D2O)(920-42-3)	
U.S California - Proposition 65 - Carcinogens List	No
U.S California - Proposition 65 - Developmental Toxicity	No
U.S California - Proposition 65 - Reproductive Toxicity - Female	No
U.S California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S Massachusetts - Right To Know List U.S Pennsylvania - RTK (Right to Know) List U.S New Jersey - Right to Know Hazardous Substance List

SECTION 16: Other information

Other information

: This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the corresponding unlabeled compound.

Full text of R-, H- and EUH-phrases:

Acute Tox. 3 (Inhalation)	Acute toxicity (inhalation) Category 3
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Flam. Liq. 3	Flammable liquids Category 3
Skin Corr. 1A	Skin corrosion/irritation Category 1A
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
R35	Causes severe burns
С	Corrosive

NFPA health hazard

: 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

NFPA fire hazard

: 2 - Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can

NFPA reactivity

: 0 - Material that in themselves are normally stable, even

under fire conditions.



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Hazard Rating

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

Flammability : 2 Moderate Hazard Physical : 0 Minimal Hazard

CIL Substance SDS

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