

SAFETY DATA SHEET

Preparation Date: 2/5/2014

Revision Date: 2/5/2014

Revision Number: G1

1. IDENTIFICATION

Product identifier

Product code: M1340
Product Name: MORPHOLINE, REAGENT, ACS

Other means of identification

Synonyms: Diethyleneimide oxide
Diethylene imidoxide
Diethylene oximide
Diethylenimide oxide
p-Isoxazine, tetrahydro-
1-Oxa-4-azacyclohexane
2H-1,4-Oxazine, tetrahydro-
4H-1,4-Oxazine, tetrahydro-
Tetrahydro-1,4-isoxazine
Tetrahydro-1,4-oxazine
Tetrahydro-2H-1,4-oxazine

CAS #: 110-91-8
RTECS # QD6475000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: Solvent.
Uses advised against No information available

Supplier: Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Order Online At: <https://www.spectrumchemical.com>

Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Regina Wachenheim (East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 4
Acute toxicity - Dermal	Category 3
Acute toxicity - Inhalation (Gases)	Category 4
Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1

Germ cell mutagenicity	Category 2
Flammable liquids	Category 3

Label elements

Danger

Hazard statements

Harmful if swallowed
 Toxic in contact with skin
 Harmful if inhaled
 Causes severe skin burns and eye damage
 Suspected of causing genetic defects
 Flammable liquid and vapor



Hazards not otherwise classified (HNOC)

Not Applicable

Other hazards

Not available

Precautionary Statements - Prevention

Obtain special instructions before use
 Do not handle until all safety precautions have been read and understood
 Use personal protective equipment as required
 Wash face, hands and any exposed skin thoroughly after handling
 Do not eat, drink or smoke when using this product
 Use only outdoors or in a well-ventilated area
 Do not breathe dust/fume/gas/mist/vapors/spray
 Keep away from heat/sparks/open flames/hot surfaces. — No smoking
 Keep container tightly closed
 Ground/bond container and receiving equipment
 Use explosion-proof electrical/ventilating/lighting/./? /equipment
 Use only non-sparking tools
 Take precautionary measures against static discharge

Precautionary Statements - Response

Immediately call a POISON CENTER or doctor/physician
 Specific treatment (see .? on this label)
 In case of fire: Use CO₂, dry chemical, or foam to extinguish.
 IF IN EYES: 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.
 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
 Wash contaminated clothing before reuse
 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. Immediately call a POISON CENTER or doctor/physician.

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Rinse mouth
Do NOT induce vomiting

Precautionary Statements - Storage

Store locked up
Store in a well-ventilated place. Keep cool

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %	Trade Secret
Morpholine 110-91-8	110-91-8	100	*

4. FIRST AID MEASURES

First aid measures

General Advice:

Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126). Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.

Skin Contact:

Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.

Eye Contact:

Flush eye with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation:

Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. **WARNING!** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.

Ingestion:

Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Toxic if swallowed. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.

Most important symptoms and effects, both acute and delayed

Symptoms

Severe skin and eye irritation or burns. Nausea. Vomiting. Dyspnea (Difficulty breathing and shortness of breath). Coughing and wheezing.

Indication of any immediate medical attention and special treatment needed

Notes to Physician:

Treat symptomatically

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

5. FIRE-FIGHTING MEASURES

Extinguishing Media

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media:	Carbon dioxide (CO ₂). Dry chemical. Alcohol-resistant foam. Water spray.
Unsuitable Extinguishing Media:	Do not use a solid (straight) water stream as it may scatter and spread fire.
<u>Specific hazards arising from the chemical</u>	
Hazardous Combustion Products:	Carbon monoxide; Carbon dioxide; Nitrogen oxides
Specific hazards:	Flammable. May be ignited by heat, sparks or flames. Container explosion may occur under fire conditions or when heated. Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Fire may produce irritating, corrosive and/or toxic gases.
<u>Special Protective Actions for Firefighters</u>	
Specific Methods:	Water mist may be used to cool closed containers. For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.
Special Protective Equipment for Firefighters:	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions:	Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Remove all sources of ignition. Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use spark-proof tools and explosion-proof equipment. In case of large spill, water spray or vapor suppressing foam may be used to reduce vapors, but may not prevent ignition in closed spaces.
<u>Environmental precautions</u>	Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas. In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

Methods and material for containment and cleaning up

Methods for containment	Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, dry sand or earth).
Methods for cleaning up	Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Use only non-sparking tools. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

7. HANDLING AND STORAGE

Technical Measures/Precautions:

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

Safe Handling Advice:

Wear personal protective equipment. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not breathe vapors or spray mist. Do not ingest. When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:

Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Keep away from heat and sources of ignition. Store in a segregated and approved area. Store away from incompatible materials.

Incompatible Materials:

Oxidizing agents. Acids. Metals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
Morpholine - 110-91-8	20 ppm TWA 70 mg/m ³ TWA	20 ppm TWA 70 mg/m ³ TWA 30 ppm STEL 105 mg/m ³ STEL	20 ppm TWA	None

Canada

Components	Alberta	British Columbia	Ontario	Quebec
Morpholine - 110-91-8	20 ppm TWA 71 mg/m ³ TWA	20 ppm TWA	20 ppm TWA	20 ppm TWAEV 71 mg/m ³ TWAEV

Australia and Mexico

Components	Australia	Mexico
Morpholine 110-91-8	20 ppm TWA 71 mg/m ³ TWA	20 ppm TWA 70 mg/m ³ TWA 30 ppm STEL 105 mg/m ³ STEL

Appropriate engineering controls

Engineering measures to reduce exposure:

Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Face-shield.

Skin and body protection: Full Suit. Gloves. boots.

Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent.

Hygiene measures:

Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:

Liquid.

Appearance:

No information available

Color:

Colorless.

Odor:

Characteristic. Amine-like.

Taste

No information available

Formula:

C4-H9-N-O

Molecular/Formula weight:

87.12

Flash point (°C):

35

Flashpoint (°C/°F):

37 °C/98.6 °F

35 °C/95 °F

Flash Point Tested according to:

Open cup

Closed cup

Lower Explosion Limit (%):

No information available

Upper Explosion Limit (%):

No information available

Autoignition Temperature (°C/°F):

295 °C/563 F

pH:

No information available

Melting point/range(°C/°F):

-5 °C/23 F

Boiling point/range(°C/°F):

128-130°C/262.4-266 °F

Decomposition temperature(°C/°F):

No information available

Specific gravity:

No information available

Density (g/cm3):

1.0 20 °C

Bulk density:

No information available

Vapor pressure @ 20°C (kPa):

1.0

Evaporation rate:

< 1 (Butyl acetate = 1)

Vapor density:

3.0

VOC content (g/L):

No information available

Odor threshold (ppm):

No information available

Partition coefficient**(n-octanol/water):**

-2.55 @ 25 °C

Viscosity:

No information available

Miscibility:

Miscible with water

Solubility:

No information available

10. STABILITY AND REACTIVITY

Reactivity

Reactive with oxidizing agents

Reactive with acids

Chemical stability**Stability:**

Stable at normal conditions

Possibility of Hazardous Reactions:

Hazardous polymerization does not occur

Conditions to avoid:

Stable at normal conditions

Incompatible Materials:

Oxidizing agents. Acids. Metals.

Hazardous decomposition products:

Carbon monoxide. Carbon dioxide. Nitrogen oxides (NOx).

Other Information**Corrosivity:**

Morpholine corrodes copper, aluminum, zinc, and galvanized surfaces.

Special Remarks on Corrosivity:

No corrosive effect on steel

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:

Ingestion. Skin. Eyes. Inhalation.

Acute Toxicity

Component Information

Morpholine - 110-91-8

LD50/oral/rat = 1050 mg/kg Oral LD50 Rat (LOLI)

1420-1440 mg/kg (European Chemicals Bureau IUCLID dataset)

1610-1630 (European Chemicals Bureau IUCLID dataset)

LD50/oral/mouse = 525 mg/kg

LD50/dermal/rabbit = 310 mg/kg Dermal LD50Rabbit (LOLI; European Chemicals Bureau IUCLID dataset)

500 mg/kg (RTECS; European Chemicals Bureau IUCLID dataset)

310-810 (European Chemicals Bureau IUCLID dataset)

LD50/dermal/rat = No information available

LC50/inhalation/rat = 8000 ppm Inhalation LC50 Rat 8 h

LC50/inhalation/mouse = No information available

Other LD50 or LC50 information = No information available

Product Information

LD50/oral/rat =

VALUE- Acute Tox Oral = 1050mg/kg

LD50/oral/mouse =

Value - Acute Tox Oral = 525mg/kg

LD50/dermal/rabbit

VALUE-Acute Tox Dermal = 310mg/kg

LD50/dermal/rat

VALUE -Acute Tox Dermal = No information available

LC50/inhalation/rat

VALUE-Vapor = No information available

VALUE-Gas = 8000ppm (8 hr)

VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse

VALUE-Vapor = No information available

VALUE - Gas = No information available

VALUE - Dust/Mist = No information available

Symptoms

Skin Contact:

Causes skin burns. Harmful if absorbed through skin. If absorbed through skin it may cause systemic effects. If absorbed through the skin, it may affect the kidneys (changes in tubules and glomeruli), and liver (fatty liver degeneration).

Eye Contact:

Causes eye burns.

Inhalation May cause chemical burns to the respiratory tract. It may affect behavior/central nervous system (ataxia). May affect behavior/central nervous system (irritability). May cause nausea, vomiting. May affect respiration. It may cause pulmonary edema. May cause cyanosis. Symptoms may include coughing and wheezing. May cause dyspnea (difficulty breathing or shortness of breath).

Ingestion Causes digestive or gastrointestinal tract burns. Corrosive to the mouth, throat, and stomach. May affect urinary system (kidneys).

Aspiration hazard No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity Prolonged or repeated inhalation may affect the liver. Prolonged or repeated inhalation may affect the kidneys. Prolonged or repeated skin absorption may affect the liver and kidneys. Prolonged or repeated ingestion may affect the kidneys. Prolonged or repeated inhalation may affect the blood (changes in white blood cell count). Repeated exposure may cause bronchitis to develop with cough, phlegm, and /or shortness of breath.

Sensitization: No information available

Mutagenic Effects: May affect genetic material
Experiments with animal lymphocytes have shown mutagenic effects
Mutagenic effects in mammalian somatic cells
Mutagenic effects on mammalian germ cells

Carcinogenic effects: Not classifiable as to its carcinogenicity to humans. Not classifiable as a human carcinogen.

Components	ACGIH - Carcinogens	IARC	NTP	OSHA HCS - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
Morpholine	A4 Not Classifiable as a Human Carcinogen	Group 3 - Monograph 71 [1999] Monograph 47 [1989]	Not listed	Not listed	Not listed	Not listed

Reproductive toxicity No data is available

Reproductive Effects: No information available
Developmental Effects: No information available
Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure No information available
STOT - repeated exposure No information available
Target Organs: Eyes. Skin. Kidneys. Liver. Respiratory system. Lungs.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: Aquatic environment.

Morpholine - 110-91-8

Freshwater Algae Data: 28 mg/L EC50 Pseudokirchneriella subcapitata 96 h
Freshwater Fish Species Data: 375 - 460 mg/L LC50 Oncorhynchus mykiss 96 h 1
350 mg/L LC50 Lepomis macrochirus 96 h static 1
1000 mg/L LC50 Brachydanio rerio 96 h static 1

Persistence and degradability: No information available

Bioaccumulative potential: Potential for bioconcentration in aquatic organisms is low.

Mobility: No information available

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:

Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:

Empty containers should be taken for local recycling, recovery or waste disposal

Components	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Morpholine	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No: UN2054
Proper Shipping Name: Morpholine
Hazard Class: 8
Subsidiary Risk: 3
Packing Group: I
Marine Pollutant: No data available
ERG No: 132
DOT RQ (lbs): No information available

TDG (Canada)

UN-No: UN2054
Proper Shipping Name: Morpholine
Hazard Class: 8
Subsidiary Risk: 3
Packing Group: I
Description: No information available

ADR

UN-No: UN2054
Proper Shipping Name: Morpholine
Hazard Class: 8
Packing Group: I
Subsidiary Risk: 3
Classification Code: No information available

14. TRANSPORT INFORMATION

Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG

UN-No: UN2054
Proper Shipping Name: Morpholine
Hazard Class: 8
Subsidiary Risk: 3
Packing Group: I
Description: No information available
IMDG Page: No information available
Marine Pollutant: No information available
EMS: F-E
MFAG: No information available
Maximum Quantity: No information available

RID

UN-No: UN2054
Proper Shipping Name: Morpholine
Hazard Class: 8
Subsidiary Risk: 8 + 3
Packing Group: I
Classification Code: No information available
Description: No information available

ICAO

UN-No: UN2054
Proper Shipping Name: Morpholine
Hazard Class: 8
Subsidiary Risk: 3
Packing Group: I
Description: No information available

IATA

UN-No: UN2054
Proper Shipping Name: Morpholine
Hazard Class: 8
Subsidiary Risk: 3
Packing Group: I
ERG Code: 8F
Description: No information available

15. REGULATORY INFORMATION

International Inventories

Components	U.S. TSCA	Philippines (PICCS)	KOREA KECL	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
<i>Morpholine</i>	Present	Present	Present KE-33492	Present (5)-859	Present	Present	Present 203-815-1

U.S. Regulations

Morpholine

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
Pennsylvania RTK: Present

Morpholine

Minnesota - Hazardous Substance List: Present
California Directors List of Hazardous Substances: Present

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Morpholine	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting <i>de minimis</i>
Morpholine	None	None	None	None	None

U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Morpholine	Not Applicable	Not Applicable

Canada

WHMIS hazard class:

B2 Flammable liquid
D1B Toxic materials
E Corrosive material

Morpholine

B2 D1B E

Canada Controlled Products Regulation:

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

Components	WHMIS Ingredient Disclosure List -
Morpholine	1 %

Inventory

Components	Canada (DSL)	Canada (NDSL)
Morpholine	Present	Not Listed

Components	CEPA Schedule I - Toxic Substances	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Morpholine	Not listed	Not listed

EU Classification

Product code: M1340

Product name: MORPHOLINE,
REAGENT, ACS

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R-phrase(s)

R10 - Flammable.

R34 - Causes burns.

R20/21/22 - Harmful by inhalation, in contact with skin and if swallowed.

S -phrase(s)

S23 - Do not breathe gas/fumes/vapor/spray.

S36 - Wear suitable protective clothing.

S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 1/2 - Keep locked up and out of the reach of children.

Components	Classification	Concentration Limits:	Safety Phrases
Morpholine	R10 Xn; R20/21/22 C; R34	10%≤C: C; R:34 1%≤C<10%: Xi; R:36/38	S1/2 S23 S36 S45

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:

C - Corrosive.

Xn - Harmful.

Flammable

**16. OTHER INFORMATION**

16. OTHER INFORMATION

NFPA	HMIS	Personal Protective Equipment
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Health Hazard	3
Fire Hazard	3
Reactivity	0



See Section 8.

Preparation Date: 2/5/2014
Revision Date: 2/5/2014
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Material Safety Data Sheet