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Material Safety Data Sheet

N-Formylmorpholine MSDS

Section 1: Chemical Product and Company Identification

Product Name: N-Formylmorpholine

Catalog Codes: Not available.

CAS#: 4394-85-8

RTECS: Not available.

TSCA: TSCA 8(b) inventory: N-Formylmorpholine

CI#: Not available.

Synonym: 4-Morpholinecarboxaldehyde

Chemical Name: 4-Formylmorpholine

Chemical Formula: C₆H₁₃NO

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Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
N-Formylmorpholine	4394-85-8	100

Toxicological Data on Ingredients:

N-Formylmorpholine: ORAL (LD50): Acute: 6500 µL/kg [Rat]. DERMAL (LD50): Acute: > 16 mL/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:

Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Potential Chronic Health Effects:

Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available.

Section 4: First Aid Measures

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin:

Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation:

Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Treat symptomatically.

Section 5: Fire and Explosion Data

General Information:

As in any fire, wear a self-contained breathing apparatus in pressuredemand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 113 deg C (235.40 deg F)

Autoignition Temperature: 345 deg C (653.00 deg F)

Explosion Limits, Lower: 1.20 vol %

Upper: 8.20 vol %

NFPA Rating: Not published.

Section 6: Accidental Release Measures

General Information:

Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7: Handling and Storage

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage:

Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8: Exposure Controls/Personal Protection

Additional information about design of technical systems:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace: Not required.

Additional information: No data

Personal protective equipment

General protective and hygienic measures

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands:

Impervious gloves

Check protective gloves prior to each use for their proper condition.

Material of gloves

The selection of suitable gloves not only depends on the material, but also on quality.

Quality will vary from manufacturer to manufacturer.

Eye protection: Safety glasses

Body protection: Protective work clothing.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Appearance: colorless

Odor: None reported.
pH: Not available.
Vapor Pressure: 3.4 mbar @ 80 C
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: 6.79 cP 30.00 deg
Boiling Point: 240 deg C @ 760.00mm Hg
Freezing/Melting Point:23 deg C
Decomposition Temperature:Not available.
Solubility: soluble
Specific Gravity/Density:1.1420g/cm3
Molecular Formula:C5H9NO2
Molecular Weight:115.13

Section 10: Stability and Reactivity Data

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, strong oxidants.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen gas.
Hazardous Polymerization: Has not been reported.

Section 11: Toxicological Information

RTECS#:
CAS# 4394-85-8: QD9694000
LD50/LC50:
CAS# 4394-85-8:
Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, skin: 500 mg/24H Mild;
Oral, rat: LD50 = 6500 uL/kg;
Skin, rabbit: LD50 = >16 mL/kg;
Carcinogenicity:
CAS# 4394-85-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12: Ecological Information

Ecotoxicity: Not available.
BOD5 and COD: Not available.
Products of Biodegradation: Not available..
Toxicity of the Products of Biodegradation: Not available.
Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Product related hazard informations:

Observe the general safety regulations when handling chemicals

National regulations

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

All components of this product are listed on the Canadian Domestic Substances List (DSL).

Information about limitation of use:

For use only by technically qualified individuals.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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