

(Dimethylaminomethyl)ferrocene

sc-227904

Material Safety Data Sheet



The Power to Question

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

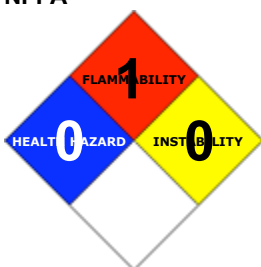
PRODUCT NAME

(Dimethylaminomethyl)ferrocene

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

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EMERGENCY:

ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS

C13-H17-Fe-N

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	1		
Toxicity:	0		
Body Contact:	0		
Reactivity:	1		
Chronic:	2		

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4

CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ The material has NOT been classified as "harmful by ingestion".
This is because of the lack of corroborating animal or human evidence.

EYE

■ Although the liquid is not thought to be an irritant, direct contact with the eye may produce transient discomfort characterized by tearing or conjunctival redness (as with windburn).

SKIN

■ The liquid may be miscible with fats or oils and may degrease the skin, producing a skin reaction described as non-allergic contact dermatitis.

The material is unlikely to produce an irritant dermatitis as described in EC Directives .

■ Open cuts, abraded or irritated skin should not be exposed to this material.

■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.

Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models).

Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

■ Inhalation hazard is increased at higher temperatures.

CHRONIC HEALTH EFFECTS

■ Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Subcutaneous injection of 3 ml of cyclopentadiene into rabbits was a narcotising dose producing fatal convulsions. Signs and symptoms during narcosis included primary motor unrest and a decreased intermittent respiration rate prior to death. The liquid produced marked local irritation, exudates in the pleural and peritoneal cavities and hyperaemia of the kidneys.

Lethal subchronic doses (332 ppm dicyclopentadiene for 10 days) produced convulsions, haemorrhage of the lungs and intestines of rats and haemorrhage of the thymus of female rats. Kidney damage was seen in rats exposed at 35 ppm for 7 hrs/day for 85 days. Some lung involvement was seen as chronic pneumonia and bronchiectasis. The no-ill effect was determined to be below 19.7 ppm.

Effects of chronic exposure to dicyclopentadiene may include damage to liver, kidneys and lungs. Repeated inhalation exposures by rats produced mild injury to both liver and kidney (centrilobular, cloudy swelling of liver cells and cloudy vacuolisation of renal tubular epithelium) at 500 ppm 7 hours/day, 53 days.

Chronic excessive intake of iron have been associated with damage to the liver and pancreas. People with a genetic disposition to poor control over iron are at an increased risk.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
(dimethylaminomethyl)ferrocene	1271-86-9	>98

Section 4 - FIRST AID MEASURES

SWALLOWED

· Immediately give a glass of water. · First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

EYE

■ If this product comes in contact with eyes: · Wash out immediately with water. · If irritation continues, seek medical attention.

SKIN

■ If skin or hair contact occurs: · Flush skin and hair with running water (and soap if available). · Seek medical attention in event of irritation.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Other measures are usually unnecessary.

NOTES TO PHYSICIAN

- Treat symptomatically.

For acute or short term repeated exposures to iron and its derivatives:

- Always treat symptoms rather than history.
- In general, however, toxic doses exceed 20mg/kg of ingested material (as elemental iron) with lethal doses exceeding 180 mg/kg.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not available
Upper Explosive Limit (%):	Not available
Specific Gravity (water=1):	1.228
Lower Explosive Limit (%):	Not available

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible.
 - Slight fire hazard when exposed to heat or flame.
- Combustion products include: carbon dioxide (CO₂), nitrogen oxides (NO_x), other pyrolysis products typical of burning organic material. May emit poisonous fumes.

FIRE INCOMPATIBILITY

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION

- Glasses:
- Chemical goggles.
- Gloves:
- Respirator:
- Type A Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.

MAJOR SPILLS

- Moderate hazard.
- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

RECOMMENDED STORAGE METHODS

- Metal can or drum
- Packing as recommended by manufacturer.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- (dimethylaminomethyl)ferrocene: CAS:1271-86-9

PERSONAL PROTECTION



RESPIRATOR

- Type A Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

EYE

- Safety glasses with side shields
- Chemical goggles.

HANDS/FEET

- Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
 - frequency and duration of contact,
 - chemical resistance of glove material,
 - glove thickness and
 - dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

- Neoprene gloves.

Wear chemical protective gloves, eg. PVC.

OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

ENGINEERING CONTROLS

- General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear an approved respirator.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.

Does not mix with water.

Sinks in water.

State	Liquid	Molecular Weight	243.13
Melting Range (°F)	Not available	Viscosity	Not Available
Boiling Range (°F)	255- 262 (2.5 mm)	Solubility in water (g/L)	Partly miscible
Flash Point (°F)	>230	pH (1% solution)	Not applicable.
Decomposition Temp (°F)	Not available.	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Not available
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	1.228
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	>1
Volatile Component (%vol)	Not available	Evaporation Rate	Not available

APPEARANCE

Brown to dark brown liquid; does not mix well with water.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

STORAGE INCOMPATIBILITY

■ The 18-Electron rule:

Organometallic complexes exhibit a wide range of stabilities and reactivities; some reaction may produce unstable compounds.

The 18-electron rule is a rule of thumb used primarily in transition metal chemistry for characterising and predicting the stability of metal complexes. Valence shells of a transition metal can accommodate 18 electrons: 2 in each of the five d orbitals (10 in total); 2 in each of the three p orbitals (6 in total); and 2 in the s orbital. In practice, of course, these orbitals cannot directly accept electrons, otherwise one would encounter ions such as Fe¹⁰⁺ and Pt⁸⁺. However, combination of these atomic orbitals with ligand orbitals gives rise to nine molecular orbitals which are either metal-ligand bonding or non-bonding. (There are also some higher energy anti-bonding orbitals). The complete filling of these nine lowest energy orbitals with electrons, whether those electrons originate from the metal or from any ligands, is the basis of the 18-electron rule. When the metal has 18 electrons, it has then achieved the same electron configuration as the noble gas at the end of the period.

Many metal complexes do not satisfy the 18-electron rule. It is, however, especially useful for organometallic complexes of the Cr, Mn, Fe, and Co triads. The ligands in a complex play an important role in determining whether or not it obeys the 18-electron rule.

- Metallocenes (metal alkyls) are compounds consisting of two cyclopentadienyl anions (Cp) bound to a metal center in the oxidation state II. These species are also called bis(cyclopentadienyl)metal complexes. According to the IUPAC definition, a metallocene contains a transition metal and two cyclopentadienyl ligands coordinated in a sandwich structure, i. e., the two cyclopentadienyl anions are co-planar with equal bond lengths and strengths. In contrast to the more strict definition proposed by IUPAC, which requires a d-block metal and a sandwich structure, the term metallocene and thus the denotation -ocene, is applied in the chemical literature also to non-transition metal compounds, such as Cp₂Ba, or structures where the aromatic rings are not co-planar, such as found in manganocene or titanocene dichloride

- A notable feature of some metallocenes is their high thermal stability. Charge-neutral metallocenes are soluble in common organic solvents and can generally be purified by vacuum sublimation.

- The chemical reactivity of the metallocenes varies widely with the metal and the substituents on the rings. Except for 18-electron metallocenes (metal= Fe, Ru, Os, Co, Rh, Ir) all transition metal and main-group metallocenes display some sensitivity to oxygen. Air stability varies from several minutes (Mg) to seconds (Ba). Such reactivity can be moderated, sometimes dramatically, by blocking physical access to the metal centre with sterically bulky groups.

- Many metal alkyl compounds are highly reactive with catalytic properties. Most non-18 electron metallocenes are pyrophoric (will ignite spontaneously upon contact with oxygen in air). Many are also water reactive and may ignite spontaneously on contact with water.

- Due to their catalytic nature many metal alkyls must be stored or transported in specially designed containers to prevent hazardous decomposition. Under most circumstances, metal alkyl solutions with a metal alkyl concentration below the so-called non-pyrophoric limit (NPL) will not ignite immediately when exposed to air.

Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

(dimethylaminomethyl)ferrocene

TOXICITY AND IRRITATION

(DIMETHYLAMINOMETHYL)FERROCENE:

■ No significant acute toxicological data identified in literature search.

Section 12 - ECOLOGICAL INFORMATION

No data

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
(dimethylaminomethyl)ferrocene	No Data Available	No Data Available		

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult Waste Management Authority for disposal.

Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

Section 15 - REGULATORY INFORMATION

(dimethylaminomethyl)ferrocene (CAS: 1271-86-9) is found on the following regulatory lists;

"Canada Non-Domestic Substances List (NDSL)", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

■ Cumulative effects may result following exposure*.

* (limited evidence).

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■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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