



MATERIAL SAFETY DATA SHEET

SDS/MSDS

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

1.1 Product identifiers

Product name : Ferrocene

CAS-No. : 102-54-5

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

Identified uses : Laboratory chemicals, Industrial & for professional use only.

1.3 Details of the supplier of the safety data sheet

Company : Bio-Chem Chemicals
5455 Nicholson Road, Science Market
Ambala Cantt, 133001 - Haryana
+91 82952 41953
info@biofinechemical.com - www.biofinechemical.com

1.4 Emergency telephone number

Emergency Phone # +91 99921 51495 (10.00am - 06.30pm) (Office Hours)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Flammable solids (Category 1), H228

Flammable solids (Category 1), H228

Acute toxicity, Oral (Category 4), H302

Acute toxicity, Oral (Category 4), H302

Acute toxicity, Inhalation (Category 4), H332

Acute toxicity, Inhalation (Category 4), H332

Reproductive toxicity (Category 2), H361

Reproductive toxicity (Category 2), H361

Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Liver, H373

Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Liver, H373

Chronic aquatic toxicity (Category 1), H410

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram

Signal word	Danger	
Hazard statement(s)		
H228	Flammable solid.	
H302 + H332	Harmful if swallowed or if inhaled	
H361	Suspected of damaging fertility or the unborn child.	
H373	May cause damage to organs (Liver) through prolonged or repeated exposure if inhaled.	
H410	Very toxic to aquatic life with long lasting effects.	
Precautionary statement(s)		
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.	
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.	
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.	
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.	
P370 + P378	In case of fire: Use dry powder or dry sand to extinguish.	
Supplemental Hazard Statements	none	

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : Bis(cyclopentadienyl)iron
Di(cyclopentadienyl)iron

Formula : $\text{Fe}(\text{C}_5\text{H}_5)_2$
Molecular weight : 186.03 g/mol
CAS-No. : 102-54-5
EC-No. : 203-039-3

Hazardous ingredients according to Regulation (EC) No 1272/2008

Component		Classification	Concentration
Ferrocene			
CAS-No.	102-54-5	Flam. Sol. 1; Acute Tox. 4;	<= 100 %
EC-No.	203-039-3	Repr. 2; STOT RE 2; Aquatic	
		Chronic 1; H228, H302, H332,	
		H361, H373, H410	
		M-Factor - Aquatic Chronic: 10	

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available**SECTION 5: Firefighting measures****5.1 Extinguishing media****Suitable extinguishing media**

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

5.2 Special hazards arising from the substance or mixture

Carbon oxides, Iron oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

Use water spray to cool unopened containers.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

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

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

6.4 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 formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition

- No smoking. Take measures to prevent the build up of electrostatic charge. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

Heat sensitive.

Storage class (TRGS 510): Flammable solid hazardous materials

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

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

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

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

9.1 Information on basic physical and chemical properties

- | | |
|---|--|
| a) Appearance | Form: crystalline |
| b) Odour | No data available |
| c) Odour Threshold | No data available |
| d) pH | No data available |
| e) Melting point/
freezing point | Melting point/range: 172 - 174 °C - lit. |
| f) Initial boiling point
and boiling range | 249 °C - lit |

g) Flash point	No data available
h) Evaporation rate	No data available
i) Flammability (solid, gas)	The substance or mixture is a flammable solid with the category 1.
j) Upper/lower flammability or explosive limits	No data available
k) Vapour pressure	No data available
l) Vapour density	No data available
m) Relative density	No data available
n) Water solubility	0.0001 g/l - slightly soluble
o) Partition coefficient: n-octanol/water	log Pow: 2.66 - The preceding data, or interpretation of data, was determined using Quantitative Structure Activity Relationship (QSAR) modeling.
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Iron oxides
Other decomposition products - No data available

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 1,320 mg/kg(Ferrocene)

Inhalation: Harmful by inhalation.(Ferrocene)

LD50 Dermal - Rat - > 3,000 mg/kg(Ferrocene)
(OECD Test Guideline 402)

Skin corrosion/irritation

Skin - Rabbit(Ferrocene)
Result: No skin irritation
(OECD Test Guideline 404)

Serious eye damage/eye irritation

Eyes - Rabbit(Ferrocene)
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitisation

Maximisation Test - Guinea pig(Ferrocene)
Result: Does not cause skin sensitisation.
(OECD Test Guideline 406)

Germ cell mutagenicity

Hamster(Ferrocene)
ovary
Sister chromatid exchange

Carcinogenicity

IARC: 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.

Reproductive toxicity

Suspected of damaging fertility or the unborn child. Suspected human reproductive toxicant(Ferrocene)

Specific target organ toxicity - single exposure

No data available(Ferrocene)

Specific target organ toxicity - repeated exposure Inhalation - May cause damage to organs through prolonged or repeated exposure. - Liver

Aspiration hazard

No data available(Ferrocene)

Additional Information

RTECS: LK0700000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Ferrocene)

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	- Leuciscus idus melanotus - 12.3 mg/l - 96 h(Ferrocene) (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 1.17 mg/l - 48 h(Ferrocene) (OECD Test Guideline 202)
Toxicity to algae	NOEC - Daphnia magna (Water flea) - 0.0015 mg/l (Ferrocene) EC50 - Desmodesmus subspicatus (Scenedesmus subspicatus) - 1.03 mg/l - 72 h(Ferrocene) (OECD Test Guideline 201)

12.2 Persistence and degradability

Biodegradability Result: 73 % - Inherently biodegradable.
(OECD Test Guideline 301B)

12.3 Bioaccumulative potential

No bioaccumulation is to be expected (log Pow <= 4).

12.4 Mobility in soil

No data available(Ferrocene)

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Very toxic to aquatic life with long lasting effects.
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable.
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

ADR/RID: 1325 IMDG: 1325 IATA: 1325

14.2 UN proper shipping name

ADR/RID: FLAMMABLE SOLID, ORGANIC, N.O.S. (Ferrocene)
IMDG: FLAMMABLE SOLID, ORGANIC, N.O.S. (Ferrocene)
IATA: Flammable solid, organic, n.o.s. (Ferrocene)

14.3 Transport hazard class(es)

ADR/RID: 4.1 IMDG: 4.1 IATA: 4.1

14.4 Packaging group

ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards

ADR/RID: no IMDG Marine pollutant: no IATA: no

14.6 Special precautions for user

No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H228	Flammable solid.
H302	Harmful if swallowed.
H302 + H332	Harmful if swallowed or if inhaled
H332	Harmful if inhaled.
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