Printing date 07/16/2021

CHEMICALS

Reviewed on 07/16/2021

1 Identification

- · Product name
- · Trade name: Bis(cyclopentadienyl)manganese, 98+% (Manganocene)
- Item number: 25-0200
- CAS Number: 73138-26-8
- · Details of the supplier of the safety data sheet
- Manufacturer/Supplier: Strem Chemicals, Inc.
 7 Mulliken Way NEWBURYPORT, MA 01950 USA info@strem.com
- Information department: Technical Department
 Emergency telephone number: EMERGENCY: CHEMTREC: +1 (800) 424-9300 During normal opening times: +1 (978) 499-1600

2 Hazard(s) identification

· Classification of the substance or mixture



Flam. Sol. 1 H228 Flammable solid.



GHS08 Health hazard

H341 Suspected of causing genetic defects.

· Label elements

Muta. 2

· GHS label elements

The substance is classified and labeled according to the Globally Harmonized System (GHS). • *Hazard pictograms*



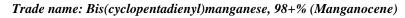
· Signal word Danger

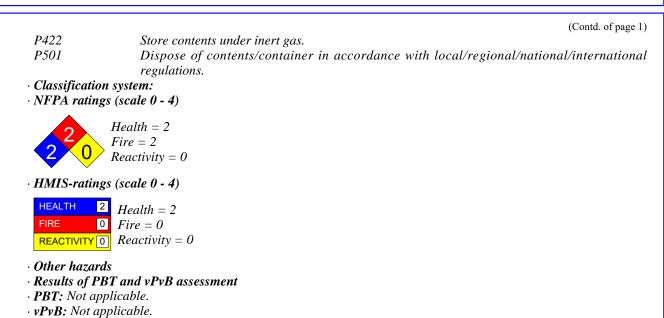
· Hazard-determining components of labeling:		
Bis(cyclopentadier	iyl)manganese, 98+% (Manganocene)	
· Hazard statements	5	
H228 Flammable .	solid.	
H341 Suspected of	f causing genetic defects.	
· Precautionary statements		
P231	Handle under inert gas.	
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.	
P222	Do not allow contact with air.	
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present		
	and easy to do. Continue rinsing.	

(Contd. on page 2)

Printing date 07/16/2021

Reviewed on 07/16/2021





3 Composition/information on ingredients

- · Chemical characterization: Substances
- · CAS No. Description
- 73138-26-8 Bis(cyclopentadienyl)manganese, 98+% (Manganocene)

4 First-aid measures

- · Description of first aid measures
- · General information: Immediately remove any clothing soiled by the product.
- · After inhalation: Supply fresh air; consult doctor in case of complaints.
- · After skin contact: Immediately rinse with water.
- · After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- · After swallowing: If symptoms persist consult doctor.
- Information for doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- · Indication of any immediate medical attention and special treatment needed
- No further relevant information available.

5 Fire-fighting measures

- · Extinguishing media
- Suitable extinguishing agents: Use fire fighting measures that suit the environment.
- Special hazards arising from the substance or mixture No further relevant information available.
- · Advice for firefighters
- · Protective equipment: No special measures required.

(Contd. on page 3)



Printing date 07/16/2021

Reviewed on 07/16/2021

Trade name: Bis(cyclopentadienyl)manganese, 98+% (Manganocene)

(Contd. of page 2)

6 Accidental release measures

- *Personal precautions, protective equipment and emergency procedures Wear protective equipment. Keep unprotected persons away.*
- · Environmental precautions: No special measures required.
- *Methods and material for containment and cleaning up: Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.*

· Reference to other sections

- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.
- · Protective Action Criteria for Chemicals

• PAC-1:

Substance is not listed.

· PAC-2:

Substance is not listed.

· PAC-3:

Substance is not listed.

7 Handling and storage

- · Handling: Handle under inert gas.
- *Precautions for safe handling* Ensure good ventilation/exhaustion at the workplace. Open and handle receptacle with care.
- Information about protection against explosions and fires: Keep ignition sources away - Do not smoke. Protect against electrostatic charges. Keep respiratory protective device available.
- · Conditions for safe storage, including any incompatibilities
- · Storage: Store contents under inert gas.
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed. Store in cool, dry conditions in well sealed receptacles.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see item 7.

· Control parameters

- · Components with limit values that require monitoring at the workplace: Not required.
- Additional information: The lists that were valid during the creation were used as basis.

· Exposure controls

- · Personal protective equipment:
- General protective and hygienic measures: Keep away from foodstuffs, beverages and feed.

(Contd. on page 4)

US

Printing date 07/16/2021

CHEMICALS, INC.

Reviewed on 07/16/2021

Trade name: Bis(cyclopentadienyl)manganese, 98+% (Manganocene)

Immediately remove all soiled and a	(Contd. of page 3
Immediately remove all soiled and co Wash hands before breaks and at the	
Store protective clothing separately.	
	proved respirator in accordance with 29 CFR 1910.134.
Protection of hands:	
Protective gloves	
	neable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommende chemical mixture.	ation to the glove material can be given for the product/ the preparation/ th
	nsideration of the penetration times, rates of diffusion and the degradation
Material of gloves	
	does not only depend on the material, but also on further marks of quality an actumer
varies from manufacturer to manufa	<i>сштет.</i>
	to be found out by the manufacturer of the protective gloves and has to b
observed.	
Eye protection: Safety glasses	
	chemical properties
General Information Appearance:	
General Information Appearance: Form:	Crystalline
General Information Appearance: Form: Color:	
General Information Appearance: Form: Color: Odor:	Crystalline Brown
	Crystalline Brown Odorless
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition	Crystalline Brown Odorless Not determined. Not applicable.
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F)
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F)
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F) Not applicable.
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point: Flammability (solid, gaseous):	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F)
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point: Flammability (solid, gaseous): Ignition temperature:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F) Not applicable. Flammable.
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point: Flammability (solid, gaseous):	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F) Not applicable.
General Information Appearance: Form: Color: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point: Flammability (solid, gaseous): Ignition temperature: Decomposition temperature:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F) Not applicable. Flammable.
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point: Flammability (solid, gaseous): Ignition temperature: Decomposition temperature: Auto igniting:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F) Not applicable. Flammable. Not determined.
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point: Flammability (solid, gaseous): Ignition temperature: Decomposition temperature: Auto igniting: Danger of explosion:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F) Not applicable. Flammable. Not determined. Not determined.
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point: Flammability (solid, gaseous): Ignition temperature: Decomposition temperature: Auto igniting: Danger of explosion: Explosion limits: Lower:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F) Not applicable. Flammable. Not determined. Not determined. Not determined. Not determined.
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point: Flammability (solid, gaseous): Ignition temperature: Decomposition temperature: Auto igniting: Danger of explosion: Explosion limits:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F) Not applicable. Flammable. Not determined. Not determined. Not determined. Not determined.
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point: Flammability (solid, gaseous): Ignition temperature: Decomposition temperature: Auto igniting: Danger of explosion: Explosion limits: Lower:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F) Not applicable. Flammable. Not determined. Not determined. Not determined. Not determined.
General Information Appearance: Form: Color: Odor: Odor threshold: pH-value: Change in condition Melting point/Melting range: Boiling point/Boiling range: Flash point: Flammability (solid, gaseous): Ignition temperature: Decomposition temperature: Auto igniting: Danger of explosion: Explosion limits: Lower: Upper:	Crystalline Brown Odorless Not determined. Not applicable. 172-173 °C (342-343 °F) 245 °C (473 °F) Not applicable. Flammable. Not determined. Not determined. Not determined. Not determined. Not determined.

Printing date 07/16/2021

Reviewed on 07/16/2021

Trade name: Bis(cyclopentadienyl)manganese, 98+% (Manganocene)

		(Contd. of page
Vapor density	Not applicable.	
Evaporation rate	Not applicable.	
Solubility in / Miscibility with		
Water:	Insoluble.	
Partition coefficient (n-octand	ol/water): Not determined.	
Viscosity:		
Dynamic:	Not applicable.	
Kinematic:	Not applicable.	
Solvent content:		
Organic solvents:	0.0 %	
VOC content:	0.0 g/l / 0.00 lb/gl	
Solids content:	100.0 %	
Other information	No further relevant information available.	

10 Stability and reactivity

- *Reactivity* No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- · Information on toxicological effects
- Acute toxicity:
- · Primary irritant effect:
- on the skin: No irritant effect.
- on the eye: No irritating effect.
- Sensitization: No sensitizing effects known.
- \cdot Additional toxicological information:

· Carcinogenic categories

· IARC (International Agency for Research on Cancer)

Substance is not listed.

· NTP (National Toxicology Program)

Substance is not listed.

· OSHA-Ca (Occupational Safety & Health Administration)

Substance is not listed.

12 Ecological information

· Toxicity

- Aquatic toxicity: No further relevant information available.
- · Persistence and degradability No further relevant information available.

(Contd. on page 6)

US

Printing date 07/16/2021

CHEMICALS, INC

Reviewed on 07/16/2021

Trade name: Bis(cyclopentadienyl)manganese, 98+% (Manganocene)

(Contd. of page 5)

- · Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- Additional ecological information:
- · General notes: Not known to be hazardous to water.
- · Results of PBT and vPvB assessment
- · PBT: Not applicable.
- **vPvB:** Not applicable.
- · Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- · Recommendation: Disposal must be made according to official regulations.

UN-Number DOT, IMDG, IATA	UN1325
UN proper shipping name	
DOT	Flammable solids, organic, n.o.s.
IMDG, IATA	FLAMMABLE SOLID, ORGANIC, N.O.S.
Transport hazard class(es)	
DOT	
· Class	4.1 Flammable solids, self-reactive substances and so
Chubb	desensitised explosives
Label	4.1
- IMDG	
Class	4
Label	4.1

Printing date 07/16/2021

CHEMICALS, INC

Reviewed on 07/16/2021

	(Contd. of pag
IATA	
Class	4.1 Flammable solids, self-reactive substances and sol
Label	desensitised explosives 4.1
	7.1
Packing group	**
DOT, IMDG, IATA	II
Environmental hazards:	
Marine pollutant:	No
Special precautions for user	Not applicable.
EMS Number:	F-A,S-G
Stowage Category	В
Transport in bulk according to Annex	II of
MARPOL73/78 and the IBC Code	Not applicable.
Transport/Additional information:	
DOT	
Quantity limitations	On passenger aircraft/rail: 15 kg
	On cargo aircraft only: 50 kg
UN ''Model Regulation'':	UN 1325 FLAMMABLE SOLIDS, ORGANIC, N.O.S., 4.1, II

15 Regulatory information

 \cdot Safety, health and environmental regulations/legislation specific for the substance or mixture \cdot Sara

Section 355 (extremely hazardous substances):
Substance is not listed.
Section 313 (Specific toxic chemical listings):
Substance is not listed.
TSCA (Toxic Substances Control Act):
Substance is not listed.
Proposition 65
Chemicals known to cause cancer:
Substance is not listed.
Chemicals known to cause reproductive toxicity for females:
Substance is not listed.
Chemicals known to cause reproductive toxicity for males:
Substance is not listed.

· Chemicals known to cause developmental toxicity:

Substance is not listed.

(Contd. on page 8)

Printing date 07/16/2021

Reviewed on 07/16/2021

Trade name: Bis(cyclopentadienyl)manganese, 98+% (Manganocene)

(Contd. of page 7)

· EPA (Environmental Protection Agency)

Substance is not listed.

• TLV (Threshold Limit Value established by ACGIH)

Substance is not listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

Substance is not listed.

· GHS label elements

The substance is classified and labeled according to the Globally Harmonized System (GHS).

• Hazard pictograms



· Signal word Danger

	ermining components of labeling: ntadienyl)manganese, 98+% (Manganocene)
· Hazard stat	
H228 Flam	mable solid.
H341 Suspe	cted of causing genetic defects.
· Precaution	ary statements
P231	Handle under inert gas.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P222	Do not allow contact with air.
P305+P351	+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P422	Store contents under inert gas.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Technical Department.

· Contact: Technical Director

· Date of preparation / last revision 07/16/2021 / -

• Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road) IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association ACGIH: American Conference of Governmental Industrial Hygienists CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

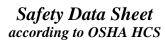
VOC: Volatile Organic Compounds (USA, EU)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

(Contd. on page 9)

⁻ US



Printing date 07/16/2021

CHEMICALS, INC.

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Trade name: Bis(cyclopentadienyl)manganese, 98+% (Manganocene)

(Contd. of page 8)

Page 9/9

NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit REL: Recommended Exposure Limit Flam. Sol. 1: Flammable solids – Category 1 Muta. 2: Germ cell mutagenicity – Category 2

US