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

1.1. Product identifier

Product form: Substance  
Physical state: Liquid  
Substance name: METHYLCYCLOPENTADIENYLMANGANESE TRICARBONYL  
Product code: OMMN038  
Formula: C9H7MnO3  
Synonyms: MMT; TRICARBONYL(METHYLCYCLOPENTADIENYL)MANGANESE; 2-METHYLCYCLOPENTADIENYLTRICARBONYL MANGANESE; METHYLCYMANTRENE; MANGANESE 2-METHYLCYCLOPENTADIENYL TRICARBONYL  
Chemical family: METAL CARBONYL

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

Use of the substance/mixture: Chemical intermediate  
For research and industrial use only

1.3. Details of the supplier of the safety data sheet

GELEST, INC.  
11 East Steel Road  
Morrisville, PA 19067  
USA  
T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST  
info@gelest.com - www.gelest.com

1.4. Emergency telephone number

Emergency number: CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification  
Acute Tox. 3 (Oral) H301  
Acute Tox. 2 (Dermal) H310  
Acute Tox. 2 (Inhalation) H330  
Eye Irrit. 2B H320  
STOT SE 3 H335  
Aquatic Acute 1 H400

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling  
Hazard pictograms (GHS-US): 

Signal word (GHS-US): Danger  
Hazard statements (GHS-US):  
H301 - Toxic if swallowed  
H310+H330 - Fatal in contact with skin or if inhaled  
H320 - Causes eye irritation  
H335 - May cause respiratory irritation  
H400 - Very toxic to aquatic life

Precautionary statements (GHS-US):  
P260 - Do not breathe mist, vapors  
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray  
P262 - Do not get in eyes, on skin, or on clothing  
P264 - Wash hands thoroughly after handling  
P270 - Do not eat, drink or smoke when using this product  
P271 - Use only outdoors or in a well-ventilated area  
P273 - Avoid release to the environment  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P284 - In case of inadequate ventilation wear respiratory protection  
P301+P310 - If swallowed: Immediately call a doctor  
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a doctor
P312 - Call a doctor if you feel unwell
P320 - Specific treatment is urgent (see first aid instructions on this label)
P321 - Specific treatment (see ... on this label)
P330 - Rinse mouth
P337+P313 - If eye irritation persists: Get medical advice/attention
P361 - Take off immediately all contaminated clothing
P363 - Wash contaminated clothing before reuse
P391 - Collect spillage
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to licensed waste disposal facility.

2.3. Other hazards
No additional information available

2.4. Unknown acute toxicity (GHS US)
No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance
Substance type: Mono-constituent
Name: METHYLCYCLOPENTADIENYMANGANESE TRICARBONYL
CAS No: 12108-13-3
EC no: 235-166-5

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl cyclopentadienyl manganese tricarbonyl</td>
<td>(CAS no) 12108-13-3</td>
<td>95-100</td>
<td>Acute Tox. 3 (Oral), H301</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Acute Tox. 2 (Dermal), H310</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Acute Tox. 2 (Inhalation), H330</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Irrit. 2B, H320</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>STOT SE 3, H335</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Acute 1, H400</td>
</tr>
</tbody>
</table>

3.2. Mixture
Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures
First-aid measures general: Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.
First-aid measures after inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician.
First-aid measures after skin contact: Wash with plenty of soap and water. Get immediate medical advice/attention.
First-aid measures after eye contact: Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.
First-aid measures after ingestion: Never give anything by mouth to an unconscious person. Immediately call a poison center or doctor/physician.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms/injuries after inhalation: Fatal if inhaled. May cause respiratory irritation. Other effects in clude heart beat acceleration and arrythmia.
Symptoms/injuries after skin contact: Fatal in contact with skin. May cause skin irritation.
Symptoms/injuries after eye contact: Causes eye irritation. Continued exposure can cause severe conjunctivitis and corneal damage.
Symptoms/injuries after ingestion: Toxic if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

4.3. Indication of any immediate medical attention and special treatment needed
No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media
Unsuitable extinguishing media: Do not use straight streams.
5.2. Special hazards arising from the substance or mixture
Fire hazard: Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame.

5.3. Advice for firefighters
Firefighting instructions: Exercise caution when fighting any chemical fire. Use water spray to cool exposed surfaces.
Protection during firefighting: Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapor and mist.

SECTION 6: Accidental release measures
6.1. Personal precautions, protective equipment and emergency procedures
6.1.1. For non-emergency personnel
Protective equipment: Wear protective equipment as described in Section 8.
Emergency procedures: Evacuate unnecessary personnel.
6.1.2. For emergency responders
Protective equipment: Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions
Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up
For containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Methods for cleaning up: Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. Collect spillage.

6.4. Reference to other sections
See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage
7.1. Precautions for safe handling
Precautions for safe handling: Avoid all eye and skin contact and do not breathe vapor and mist. Ground/bond container and receiving equipment. Use only outdoors or in a well-ventilated area.
Hygiene measures: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities
Storage area: Store in a well-ventilated place. Store away from heat.

7.3. Specific end use(s)
No additional information available

SECTION 8: Exposure controls/personal protection
8.1. Control parameters
Methyl cyclopentadienyl manganese tricarbonyl (12108-13-3)
| USA ACGIH | ACGIH TWA (mg/m³) | 0.2 mg/m³ |
| USA NIOSH | NIOSH REL (TWA) (mg/m³) | 0.2 mg/m³ |

8.2. Exposure controls
Appropriate engineering controls: Handle in an enclosing hood with exhaust ventilation.
Personal protective equipment: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Avoid all unnecessary exposure.

Hand protection: Neoprene or nitrile rubber gloves.
Eye protection: Chemical goggles. Contact lenses should not be worn.
Skin and body protection: Wear suitable protective clothing.
Respiratory protection: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. In case of inadequate ventilation wear respiratory protection.
SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- **Physical state**: Liquid
- **Appearance**: Liquid.
- **Molecular mass**: 218.09 g/mol
- **Color**: Clear to light amber.
- **Odor**: Pleasant herbaceous.
- **Odor threshold**: No data available
- **Refractive index**: 1.584
- **pH**: No data available
- **Relative evaporation rate (butyl acetate=1)**: No data available
- **Melting point**: No data available
- **Freezing point**: -1 °C
- **Boiling point**: 233 °C
- **Flash point**: 96 °C
- **Auto-ignition temperature**: No data available
- **Decomposition temperature**: No data available
- **Flammability (solid, gas)**: No data available
- **Vapor pressure**: 0.05 mm Hg @ 20˚C
- **Relative vapor density at 20 °C**: > 1
- **Relative density**: 1.38
- **Solubility**: Insoluble in water. Reacts with water.
- **Log Pow**: No data available
- **Log Kow**: No data available
- **Viscosity, kinematic**: No data available
- **Viscosity, dynamic**: No data available
- **Explosive properties**: No data available
- **Oxidizing properties**: No data available
- **Explosion limits**: No data available

9.2. Other information

- No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity
- No additional information available

10.2. Chemical stability
- Stable in sealed containers when stored in the dark under an inert atmosphere.

10.3. Possibility of hazardous reactions
- No additional information available

10.4. Conditions to avoid
- **Heat. Sparks. Open flame.**

10.5. Incompatible materials

10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects

### METHYLCYCLOPENTADIENYLMANGANESE TRICARBONYL (12108-13-3)

<table>
<thead>
<tr>
<th>Exposure Route</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE US (oral)</td>
<td>58.000 mg/kg body weight</td>
</tr>
<tr>
<td>ATE US (dermal)</td>
<td>140.000 mg/kg body weight</td>
</tr>
<tr>
<td>ATE US (gases)</td>
<td>100.000 ppmV/4h</td>
</tr>
<tr>
<td>ATE US (vapors)</td>
<td>0.500 mg/l/4h</td>
</tr>
<tr>
<td>ATE US (dust, mist)</td>
<td>0.050 mg/l/4h</td>
</tr>
</tbody>
</table>
METHYLCYCLOPENTADIENYL MANGANESE TRICARBONYL
Safety Data Sheet

<table>
<thead>
<tr>
<th>Substance</th>
<th>Toxicity</th>
<th>Skin corrosion/irritation</th>
<th>Serious eye damage/irritation</th>
<th>Respiratory or skin sensitization</th>
<th>Germ cell mutagenicity</th>
<th>Carcinogenicity</th>
<th>Reproductive toxicity</th>
<th>Specific target organ toxicity (single exposure)</th>
<th>Specific target organ toxicity (repeated exposure)</th>
<th>Aspiration hazard</th>
<th>Symptoms/Injuries after Inhalation</th>
<th>Symptoms/Injuries after Skin Contact</th>
<th>Symptoms/Injuries after Eye Contact</th>
<th>Symptoms/Injuries after Ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl cyclopentadienyl manganese tricarbonyl (12108-13-3)</td>
<td>LD50 oral rat</td>
<td>58 mg/kg</td>
<td>Not classified</td>
<td>Causes eye irritation.</td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
<td>May cause respiratory irritation.</td>
<td>Not classified</td>
<td>Not classified</td>
<td>Fatal if inhaled. May cause respiratory irritation. Other effects include heart beat acceleration and arrhythmia.</td>
<td>Fatal in contact with skin. May cause skin irritation.</td>
<td>Causes eye irritation. Continued exposure can cause severe conjunctivitis and corneal damage.</td>
<td>Toxic if swallowed. Swallowing a small quantity of this material will result in serious health hazard.</td>
</tr>
</tbody>
</table>

SECTION 12: Ecological information

12.1. Toxicity
Ecology - general: Very toxic to aquatic life.

Methyl cyclopentadienyl manganese tricarbonyl (12108-13-3)

<table>
<thead>
<tr>
<th>Substance</th>
<th>Toxicity</th>
<th>Skin corrosion/irritation</th>
<th>Serious eye damage/irritation</th>
<th>Respiratory or skin sensitization</th>
<th>Germ cell mutagenicity</th>
<th>Carcinogenicity</th>
<th>Reproductive toxicity</th>
<th>Specific target organ toxicity (single exposure)</th>
<th>Specific target organ toxicity (repeated exposure)</th>
<th>Aspiration hazard</th>
<th>Symptoms/Injuries after Inhalation</th>
<th>Symptoms/Injuries after Skin Contact</th>
<th>Symptoms/Injuries after Eye Contact</th>
<th>Symptoms/Injuries after Ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl cyclopentadienyl manganese tricarbonyl (12108-13-3)</td>
<td>LC50 fish 1</td>
<td>0.2 mg/l</td>
<td>Not classified</td>
<td>Causes eye irritation.</td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
<td>May cause respiratory irritation.</td>
<td>Not classified</td>
<td>Not classified</td>
<td>Fatal if inhaled. May cause respiratory irritation. Other effects include heart beat acceleration and arrhythmia.</td>
<td>Fatal in contact with skin. May cause skin irritation.</td>
<td>Causes eye irritation. Continued exposure can cause severe conjunctivitis and corneal damage.</td>
<td>Toxic if swallowed. Swallowing a small quantity of this material will result in serious health hazard.</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential
No additional information available

12.4. Mobility in soil
No additional information available

12.5. Other adverse effects
Effect on ozone layer: No additional information available
Effect on the global warming: No known ecological damage caused by this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Sewage disposal recommendations: Do not dispose of waste into sewer.
Waste disposal recommendations: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
Ecology - waste materials: Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number
UN-No.(DOT): 3281
DOT NA no.: UN3281
14.2. UN proper shipping name

Proper Shipping Name (DOT) : Metal carbonyls, liquid, n.o.s.
(METHYLCYCLOPENTADIENYLMANGANESE TRICARBONYL)
Hazard labels (DOT) : 6.1 - Poison

DOT Symbols : G - Identifies PSN requiring a technical name
Packing group (DOT) : II - Medium Danger
DOT Packaging Exceptions (49 CFR 173.xxx) : 153
DOT Packaging Non Bulk (49 CFR 173.xxx) : 202
DOT Packaging Bulk (49 CFR 173.xxx) : 243

14.3. Additional information

Other information : No supplementary information available.

Transport by sea

DOT Vessel Stowage Location : B - (i) The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) “On deck only” on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.

DOT Vessel Stowage Other : 40 - Stow “clear of living quarters”

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 5 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 60 L

SECTION 15: Regulatory information

15.1. US Federal regulations

Methyl cyclopentadienyl manganese tricarbonyl (12108-13-3)
- Listed on the United States TSCA (Toxic Substances Control Act) inventory
- Listed on the United States SARA Section 302
- SARA Section 302 Threshold Planning Quantity (TPQ) : 100

15.2. International regulations

Methyl cyclopentadienyl manganese tricarbonyl (12108-13-3)
- Listed on the AICS (Australian Inventory of Chemical Substances)
- Listed on the Canadian DSL (Domestic Substances List)
- Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
- Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
- Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
- Listed on the Korean ECL (Existing Chemicals List)
- Listed on NZIoC (New Zealand Inventory of Chemicals)
- Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
- Japanese Pollutant Release and Transfer Register Law (PRTR Law)
- Listed on the Canadian IDL (Ingredient Disclosure List)
- Listed on INSQ (Mexican national Inventory of Chemical Substances)

15.3. US State regulations

METHYLCYCLOPENTADIENYLMANGANESE TRICARBONYL (12108-13-3)

- U.S. - California - Proposition 65 - Carcinogens List : No
- U.S. - California - Proposition 65 - Developmental Toxicity : No
- U.S. - California - Proposition 65 - Reproductive Toxicity - Female : No
- U.S. - California - Proposition 65 - Reproductive Toxicity - Male : No
METHYLCYCLOPENTADIENYLMANGANESE TRICARBONYL
Safety Data Sheet

Methyl cyclopentadienyl manganese tricarbonyl (12108-13-3)

<table>
<thead>
<tr>
<th>U.S. - California - Proposition 65 - Carcinogens List</th>
<th>U.S. - California - Proposition 65 - Developmental Toxicity</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</th>
<th>Non-significant risk level (NSRL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

SECTION 16: Other information

Abbreviations and acronyms:

- Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development.

Full text of H-phrases:

- Acute Tox. 2 (Dermal) Acute toxicity (dermal) Category 2
- Acute Tox. 2 (Inhalation) Acute toxicity (inhalation) Category 2
- Acute Tox. 3 (Oral) Acute toxicity (oral) Category 3
- Aquatic Acute 1 Hazardous to the aquatic environment - Acute Hazard Category 1
- Eye Irrit. 2B Serious eye damage/eye irritation Category 2B
- STOT SE 3 Specific target organ toxicity (single exposure) Category 3
- H301 Toxic if swallowed
- H310 Fatal in contact with skin
- H320 Causes eye irritation
- H330 Fatal if inhaled
- H335 May cause respiratory irritation
- H400 Very toxic to aquatic life

HMIS III Rating

- Health: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
- Flammability: 2 Moderate Hazard
- Physical: 1 Slight Hazard

Prepared by safety and environmental affairs.

Date of issue: 10/21/2015 Version: 1.0

SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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