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

1.1 Product identifier
Trade name : Imidocarb Injection Formulation

1.2 Relevant identified uses of the substance or mixture and uses advised against
Use of the Substance/Mixture : Veterinary product

1.3 Details of the supplier of the safety data sheet
Company : MSD
            20 Spartan Road
            1619 Spartan, South Africa
Telephone : +27119239300
Telefax : 908-735-1496
E-mail address of person responsible for the SDS : EHSDATASTEWARD@msd.com

1.4 Emergency telephone number
1-908-423-6000

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Classification (REGULATION (EC) No 1272/2008)
Reproductive toxicity, Category 2 : H361d: Suspected of damaging the unborn child.
Specific target organ toxicity - single exposure, Category 1 : H370: Causes damage to organs.
Specific target organ toxicity - repeated exposure, Category 1 : H372: Causes damage to organs through prolonged or repeated exposure.

2.2 Label elements
Labelling (REGULATION (EC) No 1272/2008)
Hazard pictograms : 
Signal word : Danger
Hazard statements : H361d Suspected of damaging the unborn child.
                 H370  Causes damage to organs.
                 H372  Causes damage to organs through prolonged or repeated exposure.
Precautionary statements:

**Prevention:**
- P201 Obtain special instructions before use.
- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.

**Response:**
- P308 + P311 IF exposed or concerned: Call a POISON CENTER/doctor.

**Storage:**
- P405 Store locked up.

Hazardous components which must be listed on the label:
imidocarb

### 2.3 Other hazards
None known.

## SECTION 3: Composition/information on ingredients

### 3.2 Mixtures

#### Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>imidocarb</td>
<td>27885-92-3</td>
<td>248-711-7</td>
<td></td>
<td></td>
<td>Acute Tox.4; H302 Repr.2; H361d STOT SE1; H370 STOT RE1; H372</td>
<td>&gt;= 10 - &lt; 20</td>
</tr>
<tr>
<td>Propionic acid</td>
<td>79-09-4</td>
<td>201-176-3</td>
<td>607-089-00-0</td>
<td></td>
<td>Flam. Liq.3; H226 Skin Corr.1B; H314 Eye Dam.1; H318 STOT SE3; H335</td>
<td>&gt;= 3 - &lt; 5</td>
</tr>
</tbody>
</table>

For explanation of abbreviations see section 16.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

**General advice:** In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.

**Protection of first-aiders:** First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

**If inhaled:** If inhaled, remove to fresh air. Get medical attention.
In case of skin contact: In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

In case of eye contact: Flush eyes with water as a precaution. Get medical attention if irritation develops and persists.

If swallowed: If swallowed, DO NOT induce vomiting. Get medical attention. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed
Risks: Suspected of damaging the unborn child. Causes damage to organs. Causes damage to organs through prolonged or repeated exposure.

4.3 Indication of any immediate medical attention and special treatment needed
Treatment: Treat symptomatically and supportively.

SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing media: Water spray
                          Alcohol-resistant foam
                          Carbon dioxide (CO2)
                          Dry chemical

Unsuitable extinguishing media: None known.

5.2 Special hazards arising from the substance or mixture
Specific hazards during firefighting: Exposure to combustion products may be a hazard to health.
Hazardous combustion products: Carbon oxides

5.3 Advice for firefighters
Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.
Specific extinguishing methods: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers.
Remove undamaged containers from fire area if it is safe to do so. Evacuate area.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions: Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

6.2 Environmental precautions

Environmental precautions: Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up: Soak up with inert absorbent material. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures: See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Local/Total ventilation: Use only with adequate ventilation.

Advice on safe handling: Avoid inhalation of vapour or mist. Do not swallow. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment. Take care to prevent spills, waste and minimize release to the
Hygiene measures:
If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.
The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

7.2 Conditions for safe storage, including any incompatibilities
Requirements for storage areas and containers:
Keep in properly labelled containers. Store locked up. Store in accordance with the particular national regulations.

Advice on common storage:
Do not store with the following product types:
- Strong oxidizing agents
- Organic peroxides
- Explosives
- Gases

7.3 Specific end use(s)
Specific use(s):
No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imidocarb</td>
<td>27885-92-3</td>
<td>TWA</td>
<td>40 µg/m3 (OEB 3)</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wipe limit</td>
<td>400 µg/100 cm²</td>
<td>Internal</td>
</tr>
<tr>
<td>Propionic acid</td>
<td>79-09-4</td>
<td>STEL OEL-RL</td>
<td>15 ppm 45 mg/m3</td>
<td>ZA OEL</td>
</tr>
</tbody>
</table>

Further information: Recommended Limit

| TWA OEL-RL      | 10 ppm 30 mg/m3 | ZA OEL                        |
| TWA             | 10 ppm 31 mg/m3 | 2000/39/EC                    |
| STEL            | 20 ppm 62 mg/m3 | 2000/39/EC                    |

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propionic acid</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>31 mg/m3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Acute systemic effects</td>
<td>62 mg/m3</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>31 mg/m3</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

Imidocarb Injection Formulation

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Details</th>
</tr>
</thead>
</table>
| 8.2 | Exposure controls | Engineering measures: Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., drip-less quick connections). All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment. Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices). Minimize open handling.

Personal protective equipment:

Eye protection: Wear safety glasses with side shields or goggles. If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles. Wear a face shield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.

Hand protection:

Material: Chemical-resistant gloves

Remarks: Consider double gloving.

Skin and body protection: Work uniform or laboratory coat. Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces. Use appropriate degowning techniques to remove potentially contaminated clothing.

Respiratory protection: If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.

Filter type: Combined particulates and organic vapour type (A-P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties:

Appearance: liquid
## Imidocarb Injection Formulation

**Colour**: clear  
**Odour**: No data available  
**Odour Threshold**: No data available  

**pH**: 4.5  
**Melting point/freezing point**: 100 °C  
**Initial boiling point and boiling range**: No data available  
**Flash point**: No data available  
**Evaporation rate**: No data available  
**Flammability (solid, gas)**: Not applicable  
**Upper explosion limit / Upper flammability limit**: No data available  
**Lower explosion limit / Lower flammability limit**: No data available  
**Vapour pressure**: No data available  
**Relative vapour density**: No data available  
**Density**: No data available  
**Water solubility**: soluble  
**Partition coefficient: n-octanol/water**: No data available  
**Auto-ignition temperature**: No data available  
**Decomposition temperature**: No data available  
**Viscosity**: No data available  
**Viscosity, kinematic**: No data available  
**Explosive properties**: Not explosive  
**Oxidizing properties**: The substance or mixture is not classified as oxidizing.

### 9.2 Other information

**Flammability (liquids)**: No data available  
**Molecular weight**: No data available  
**Particle size**: No data available
SECTION 10: Stability and reactivity

10.1 Reactivity
   Not classified as a reactivity hazard.

10.2 Chemical stability
   Stable under normal conditions.

10.3 Possibility of hazardous reactions
   Hazardous reactions: Can react with strong oxidizing agents.

10.4 Conditions to avoid
   Conditions to avoid: None known.

10.5 Incompatible materials
   Materials to avoid: Oxidizing agents

10.6 Hazardous decomposition products
   No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on toxicological effects
   Information on likely routes of exposure:
     Inhalation
     Skin contact
     Ingestion
     Eye contact

   Acute toxicity
   Not classified based on available information.

   Product:
   Acute oral toxicity: Acute toxicity estimate: > 2.000 mg/kg
   Method: Calculation method

   Components:
   imidocarb:
   Acute oral toxicity: LD50 (Rat): 1.216 - 1.652 mg/kg
   LD50 (Mouse): 544 - 702 mg/kg
   LD50 (Rabbit): 317 mg/kg

   Acute inhalation toxicity: Remarks: No data available

   Acute dermal toxicity: Remarks: No data available

   Acute toxicity (other routes of administration): LD50 (Rat): 32.7 mg/kg
   Application Route: Intravenous
LD50 (Mouse): 22.3 mg/kg
Application Route: Intravenous

**Propionic acid:**
**Acute oral toxicity**: LD50 (Rat): 3.455,1 mg/kg
**Acute dermal toxicity**: LD50 (Rat): 3.235 mg/kg

**Skin corrosion/irritation**
Not classified based on available information.

**Components:**
- **imidocarb:** Remarks: No data available
- **Propionic acid:**
  - **Species**: Rabbit
  - **Result**: Corrosive after 3 minutes to 1 hour of exposure

**Serious eye damage/eye irritation**
Not classified based on available information.

**Components:**
- **imidocarb:** Remarks: No data available
- **Propionic acid:**
  - **Species**: Rabbit
  - **Result**: Irreversible effects on the eye

**Respiratory or skin sensitisation**

**Skin sensitisation**
Not classified based on available information.

**Respiratory sensitisation**
Not classified based on available information.

**Components:**
- **imidocarb:**
  - Remarks: No data available
- **Propionic acid:**
  - **Test Type**: Maximisation Test
  - **Exposure routes**: Skin contact
  - **Species**: Guinea pig
  - **Result**: negative
  - Remarks: Based on data from similar materials
Germ cell mutagenicity
Not classified based on available information.

Components:

imidocarb:
Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Result: negative

Test Type: Chromosome aberration test in vitro
Result: equivocal

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: Oral
Result: negative

Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Oral
Result: negative

Propionic acid:
Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Chinese hamster
Application Route: Intraperitoneal injection
Result: negative

Carcinogenicity
Not classified based on available information.

Components:

imidocarb:
Species : Rat
Application Route : Oral
Exposure time : 104 weeks
LOAEL : 240 mg/kg body weight
Result : negative
Target Organs : Mammary gland
Remarks : The mechanism or mode of action may not be relevant in humans.
Propionic acid:
Species: Rat
Application Route: Ingestion
Exposure time: 2 Years
Result: negative

Reproductive toxicity
Suspected of damaging the unborn child.

Components:

imidocarb:
Effects on fertility:
Species: Rat
Application Route: Oral
Fertility: LOAEL: 135 mg/kg body weight
Result: Adverse neonatal effects.

Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Oral
Fertility: NOAEL: 45 mg/kg body weight

Effects on foetal development:
Species: Rat
Application Route: Oral
Developmental Toxicity: LOAEL: 76 mg/kg body weight
Result: Effects on foetal development, No teratogenic effects

Test Type: Embryo-foetal development
Species: Rat
Application Route: Oral
Developmental Toxicity: NOAEL: 19 mg/kg body weight

Test Type: Embryo-foetal development
Species: Rabbit
Application Route: Oral
Developmental Toxicity: NOAEL: 20 mg/kg body weight
Result: No effects on foetal development

Reproductive toxicity - Assessment:
Some evidence of adverse effects on development, based on animal experiments.

Propionic acid:
Effects on foetal development:
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

STOT - single exposure
Causes damage to organs.
Components:
imidocarb:
Target Organs: Central nervous system
Assessment: Causes damage to organs.

Propionic acid:
Assessment: May cause respiratory irritation.

STOT - repeated exposure
Causes damage to organs through prolonged or repeated exposure.

Components:
imidocarb:
Target Organs: Liver, Kidney
Assessment: Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:
imidocarb:
Species: Rat
LOAEL: 125 mg/kg
Application Route: Oral
Exposure time: 90 Days
Target Organs: Liver

Species: Rat
NOAEL: 76 mg/kg
LOAEL: 415 mg/kg
Application Route: Oral
Exposure time: 90 Days
Target Organs: Liver

Species: Dog
LOAEL: 5 mg/kg
Application Route: Oral
Exposure time: 90 Days
Target Organs: Liver, Kidney
Symptoms: muscle twitching, Salivation, recumbency, ataxia, splayed legs

Species: Rat
NOAEL: 15 mg/kg
LOAEL: 60 mg/kg
Application Route: Oral
Exposure time: 104 Weeks
Target Organs: Liver, Kidney, Blood

Species: Monkey
NOAEL: 5 mg/kg
Application Route: Oral
Exposure time : 30 Days
Remarks : No significant adverse effects were reported

Propionic acid:
Species : Rat
NOAEL : 50000 ppm
Application Route : Ingestion
Exposure time : 90 Days

Aspiration toxicity
Not classified based on available information.

Experience with human exposure

Components:

imidocarb:
Inhalation : Target Organs: Central nervous system
          Symptoms: Salivation, muscle twitching, Tremors, Lachrymation, ataxia, lethargy
          Remarks: Based on Animal Evidence

SECTION 12: Ecological information

12.1 Toxicity

Components:

Propionic acid:
Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill sunfish)): 85,3 mg/l
                      Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 22,7 mg/l
                      Exposure time: 48 h
Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 48,7 mg/l
                      Exposure time: 72 h

12.2 Persistence and degradability

Components:

Propionic acid:
Biodegradability : Result: Readily biodegradable.
                      Biodegradation: 93 %
                      Exposure time: 20 d

12.3 Bioaccumulative potential

Components:

imidocarb:
Partition coefficient: n- log Pow: 3,88
Imidocarb Injection Formulation

octanol/water

**Propionic acid:**
Partition coefficient: n-octanol/water: log Pow: 0.33

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
Not relevant

12.6 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Product: Dispose of in accordance with local regulations. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.
Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal. If not otherwise specified: Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number
Not regulated as a dangerous good

14.2 UN proper shipping name
Not regulated as a dangerous good

14.3 Transport hazard class(es)
Not regulated as a dangerous good

14.4 Packing group
Not regulated as a dangerous good

14.5 Environmental hazards
Not regulated as a dangerous good

14.6 Special precautions for user
Not applicable

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
Remarks: Not applicable for product as supplied.
15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

The components of this product are reported in the following inventories:

- AICS: not determined
- DSL: not determined
- IECSC: not determined

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Other information: Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Full text of H-Statements

H226: Flammable liquid and vapour.
H302: Harmful if swallowed.
H314: Causes severe skin burns and eye damage.
H318: Causes serious eye damage.
H335: May cause respiratory irritation.
H361d: Suspected of damaging the unborn child.
H370: Causes damage to organs if swallowed.
H372: Causes damage to organs through prolonged or repeated exposure if swallowed.

Full text of other abbreviations

- Acute Tox.: Acute toxicity
- Eye Dam.: Serious eye damage
- Flam. Liq.: Flammable liquids
- Repr.: Reproductive toxicity
- Skin Corr.: Skin corrosion
- STOT RE: Specific target organ toxicity - repeated exposure
- STOT SE: Specific target organ toxicity - single exposure
- ZA OEL: South Africa. Hazardous Chemical Substances Regulations, Occupational Exposure Limits

- 2000/39/EC / TWA: Limit Value - eight hours
- 2000/39/EC / STEL: Short term exposure limit
- ZA OEL / TWA OEL-RL: Long term occupational exposure limits - recommended limit
- ZA OEL / STEL OEL-RL: Short term occupational exposure limits - recommended limit

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regula-
Further information


Classification of the mixture:

<table>
<thead>
<tr>
<th>Repr. 2</th>
<th>STOT SE 1</th>
<th>STOT RE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>H361d</td>
<td>H370</td>
<td>H372</td>
</tr>
</tbody>
</table>

Classification procedure:

- Calculation method

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user’s end product, if applicable.

ZA / EN