

SAFETY DATA SHEET

AVIBROM®

Preparation Date : 21-Mar-2012

Revision Date: 12-Dec-2016

Revision Number: 2

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Identifier**Product Name** AVIBROM®**Other means of identification****CAS-No** 77-48-5**Formula** C5H6Br2N2O2**Recommended use of the chemical and restrictions on use****General function** Poultry carcass antimicrobial.**Uses advised against** No information available**Details of the supplier of the safety data sheet****Company** Albemarle Corporation
451 Florida Street
Baton Rouge, LA 70801Albemarle Chemical Canada
1600, 421-7th Avenue, SW
Calgary, Alberta
Canada T2P 4K9**For Non-Emergency** 800-535-3030**'Competent Body for SDS'** HSE@Albemarle.com**Emergency telephone number****Emergency Telephone Numbers** In case of emergency, call Albemarle emergency response at +1 225 344 7147

2. HAZARDS IDENTIFICATION

Classification

| | |
|-----------------------------------|---------------------------|
| Acute Toxicity - Oral | Category 4 |
| Skin Corrosion/irritation | Category 1 Sub-category B |
| Serious eye damage/eye irritation | Category 1 |
| Acute aquatic toxicity | Category 1 |
| Chronic aquatic toxicity | Category 1 |

Label elements**Emergency Overview****Danger****Hazard Statements**

Harmful if swallowed

Causes severe skin burns and eye damage

Very toxic to aquatic life with long lasting effects



Physical state Solid

Color White/Off-white

Odor Halogen

Prevention

Wash face, hands and any exposed skin thoroughly after handling
 Do not eat, drink or smoke when using this product
 Do not breathe dust/fume/gas/mist/vapors/spray
 Wear protective gloves/protective clothing/eye protection/face protection
 Avoid release to the environment

Response

Immediately call a POISON CENTER or doctor/physician
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 Immediately call a POISON CENTER or doctor/physician
 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
 Wash contaminated clothing before reuse
 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing Immediately call a POISON CENTER or doctor/physician
 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell Rinse mouth Do not induce vomiting
 Collect spillage

Storage

Store locked up

Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Not applicable

Other Information

- May be harmful in contact with skin

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS-No | Weight % |
|------------------------------------|---------|----------|
| 1,3-Dibromo-5,5-dimethyl hydantoin | 77-48-5 | 100 |

4. FIRST AID MEASURES

First aid measures

Eye contact

If in eyes, hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

Skin contact

If on skin or clothing, take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

| | |
|-------------------|---|
| Inhalation | If inhaled, move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice. |
| Ingestion | If swallowed, call a physician or Poison Control Centre immediately. Have person sip a glass of water if able to swallow. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. |

Most important symptoms and effects, both acute and delayed

Symptoms No information available.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

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| 5. FIRE-FIGHTING MEASURES |
|----------------------------------|

Extinguishing media

Suitable extinguishing media Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Unsuitable Extinguishing Media No information available.

Specific Hazards Arising from the Chemical

Combustion/explosion hazards No information available.

Hazardous Combustion Products Oxides of carbon. Bromine.

Explosion Data

Sensitivity to mechanical impact None.

Sensitivity to static discharge None.

Protective Equipment and Precautions for Firefighters

Toxic fumes may be present; use of respirator suggested.

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| 6. ACCIDENTAL RELEASE MEASURES |
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Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes and clothing. Avoid dust formation. Ensure adequate ventilation.

Environmental Precautions

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning up Sweep up and shovel into suitable containers for disposal.

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| 7. HANDLING AND STORAGE |
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Precautions for safe handling

Handling Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Avoid dust formation.

Conditions for safe storage, including any incompatibilities

Storage Store in well-ventilated, cool (<120F), dry area, away from heat or flame. Store in containers made of HDPE, LDPE, or PP. Do not store in metal or fiberboard containers. Close container when not in use.

Incompatible Materials None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

| Component | CAS-No | ACGIH TLV (TWA) | OSHA PEL (TWA) | NIOSH IDLH |
|------------------------------------|---------|-----------------|----------------|------------|
| 1,3-Dibromo-5,5-dimethyl hydantoin | 77-48-5 | - | - | - |

| Component | CAS-No | Alberta | British Columbia | Ontario | Quebec |
|------------------------------------|---------|---------|------------------|---------|--------|
| 1,3-Dibromo-5,5-dimethyl hydantoin | 77-48-5 | - | - | - | - |

Appropriate engineering controls

Engineering Controls Use only in well-ventilated areas.

Individual protection measures, such as personal protective equipment

- Eye/face Protection** Chemical goggles. Face-shield.
- Skin Protection** Wear protective gloves/clothing.
- Hand protection** Rubber gloves resistant to chemical permeation.
- Respiratory protection** NIOSH approved dust/mist respirator under dusty or irritating conditions.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

| | |
|-------------------------------------|-------------------------------------|
| Physical state | Solid |
| Color | White/Off-white |
| Odor | Halogen |
| Odor Threshold | No information available |
| Molecular Weight | 286 |
| pH | 6.0 - 6.5 (1% slurry in pH 7 water) |
| Melting point/freezing point | >190 °C (Decomposes) |
| Boiling Point/Range | |
| Flash Point | Not applicable. |
| Evaporation Rate | No information available |
| Flammability (solid, gas) | No information available |
| Flammability Limit in Air | |
| Upper flammability limit: | No information available |
| Lower flammability limit: | No information available |
| Vapor Pressure | No information available |
| Vapor Density | No data available |
| Density | |
| Solubility(ies) | |
| Water Solubility | ~0.1% |
| Solubility in other solvents | No information available |
| Partition coefficient : | |
| Autoignition temperature | No information available |
| Decomposition temperature | No information available |
| Viscosity, kinematic | No information available |
| Dynamic viscosity | No information available |
| Explosive Properties | No information available |
| Oxidizing Properties | Oxidizer |

10. STABILITY AND REACTIVITY

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|---|--|
| Reactivity Hazard | No data available. |
| Stability | Stable. |
| Hazardous Reactions | No hazardous reaction expected under normal handling. |
| Hazardous Polymerization | None under normal processing. |
| Conditions to Avoid | Avoid extremely high heat and flame. |
| Materials to avoid | This product is a strong oxidizing and brominating agent. Avoid contact with reducing agents, acids, ammonia-containing products, organic materials (such as aldehydes and alcohols) and other oxidizing agents (such as calcium hypochlorite). Avoid contact with common metals such as aluminum, iron, copper, brass and steel. Contact with incompatible materials can promote the exothermic decomposition of the product. |
| Hazardous decomposition products | Carbon oxides. Bromine. |

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

| | |
|---------------------|---|
| Inhalation | Harmful by inhalation. |
| Eye contact | Possible risk of irreversible effects. |
| Skin contact | Causes burns. Harmful if absorbed through skin. |
| Ingestion | Harmful if swallowed. |

Potential Health Effects

Acute Effects

| | |
|--|----------------------------------|
| Skin Corrosion/irritation | Corrosive to skin. Causes burns. |
| Serious eye damage/eye irritation | Risk of serious damage to eyes. |
| Respiratory irritation : | Harmful by inhalation |
| Sensitization | Not expected to be a sensitizer. |
| STOT - single exposure | No information available. |

Chronic Effects

Mutagenic Effects No information available.

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen.

| Component | CAS-No | ACGIH Carcinogens | IARC | NTP | OSHA Regulated Carcinogens |
|---------------------------------------|---------|----------------------|------|-----|-------------------------------|
| 1,3-Dibromo-5,5-dimethyl hydantoin | 77-48-5 | - | - | - | - |

| | |
|---------------------------------|---------------------------|
| Reproductive Effects | None known. |
| STOT - repeated exposure | No information available. |
| Chronic Effects | None known. |
| Aspiration hazard | No information available. |

Numerical measures of toxicity**Product Information**

The following values are calculated based on chapter 3.1 of the GHS document .

| | |
|------------------------|---|
| ATEmix (oral) | 448 mg/kg |
| ATEmix (dermal) | 2001 mg/kg |
| LD50 Oral: | 448 mg/kg of body weight (rat) mg/kg (EVIC-CEBA n° 98/0194 - 03/1998) |
| LD50 Dermal: | > 2,000 (guinea pig) (rat) estimated |

Component Information

| Component | Rat Oral LD50: | Rabbit Dermal LD50: | Rat Dermal LD50 : | Rat Inhalation LC50: |
|---|----------------|---------------------|-------------------|-----------------------|
| 1,3-Dibromo-5,5-dimethyl hydantoin 77-48-5 | 448 mg/kg bw | - | >2000 mg/kg bw | 0.51 - 2.02 mg/l (4h) |

Other data SKIN IRRITATION, Rabbit (albino New Zealand): Product is considered corrosive to the skin.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Very toxic to aquatic life with long lasting effects

EC50/48h/Daphnia : 0.7 mg/L
EC50/48h/Rainbow Trout = 0.4 mg/L

| Component | Freshwater Algae EC50/72h : | Freshwater Fish LC50/96h : | Water Flea EC50/48h : |
|---|--------------------------------|-------------------------------|-----------------------|
| 1,3-Dibromo-5,5-dimethyl hydantoin (CAS #: 77-48-5) | - | 0.53 mg/l | 0.7 mg/l |

Persistence/Degradability No information available.

Bioaccumulation/ Accumulation No information available.

Mobility in Environmental Media No information available.

Other adverse effects No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste Disposal Method Dispose in a safe manner in accordance with local/national regulations.

Contaminated Packaging Do not reuse container.

14. TRANSPORT INFORMATION

DOT

Proper Shipping Name Oxidizing solid, corrosive, n.o.s. (1,3-Dibromo-5,5-dimethyl hydantoin)
Hazard Class 5.1
Subsidiary Class 8
UN No. 3085
Packing Group II
Marine Pollutant: Y.
Description UN 3085 Oxidizing solid, corrosive, n.o.s. (1,3-Dibromo-5,5-dimethyl hydantoin), 5.1, II

TDG

This material is considered as Dangerous Goods per regulations of Transport Canada. The use of the above US DOT information from US 49 CDR regulations is allowed for shipments that originate in the United States.

IMDG/IMO

IMO Class 5.1
Packing Group II
UN-No 3085
IMO Labelling and Marking 5.1 + 8 + Marine Pollutant Marking
Proper Shipping Name Oxidizing solid, corrosive, n.o.s. (1,3-Dibromo-5,5-dimethyl hydantoin)
EmS F-A, S-Q
Marpol - Annex II Not applicable
Marpol - Annex III Marine pollutant
Transport Description UN 3085 Oxidizing solid, corrosive, n.o.s. (1,3-Dibromo-5,5-dimethyl hydantoin), 5.1, II, Marine pollutant

IATA/ICAO

IATA/ICAO Class 5.1
Packing Group II
UN-No 3085
IATA/ICAO Labelling/Marking 5.1 + 8 + 'Environmentally hazardous substance' mark
Passenger Aircraft Maximum net quantity per package: 5 kg
Cargo aircraft only Maximum net quantity per package: 25 kg
Proper shipping name Oxidizing solid, corrosive, n.o.s. (1,3-Dibromo-5,5-dimethyl hydantoin)
Transport Description UN 3085 Oxidizing solid, corrosive, n.o.s. (1,3-Dibromo-5,5-dimethyl hydantoin), 5.1, II, Environmentally hazardous substance

| 15. REGULATORY INFORMATION | | | | | | | | | | | |
|-----------------------------------|-------------|------------|-------------|-------------|---------------|-------------|-------------|--------------|--------------|--------------|-------------|
| International Inventories | TSCA | DSL | NDSL | AICS | EINECS | ENCS | KECL | PICCS | IECSC | NZIoC | TCSI |
| AVIBROM® | X | X | - | X | X | X | X | X | X | X | X |

(X) Complies (-) Does not Comply

THIS MATERIAL IS EXEMPT FROM THE TOXIC SUBSTANCES CONTROL ACT (15 USC 2601-2629)

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazardous Categorization

Acute Health Hazard Yes
Chronic Health Hazard No
Fire Hazard No
Sudden Release of Pressure Hazard No
Reactive Hazard Yes

Reportable and Threshold Planning Quantities

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

State Right-to-Know

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| 16. OTHER INFORMATION |
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|-------------|----------|----------------|---------------|--------------------|
| NFPA | Health 3 | Flammability 1 | Instability 1 | Physical Hazards - |
| HMIS | Health 3 | Flammability 1 | | Physical Hazards 1 |

Prepared By Health & Environment Department Albemarle Corporation

FOR ADDITIONAL NONEMERGENCY PRODUCT INFORMATION, CONTACT:

HEALTH AND ENVIRONMENT DEPARTMENT
 ALBEMARLE CORPORATION
 451 FLORIDA ST.
 BATON ROUGE, LA. 70801
 (800) 535-3030

Preparation Date : 21-Mar-2012

Revision Date: 12-Dec-2016

Disclaimer:

The information contained herein is accurate to the best of our knowledge. The Company makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances.

End of Safety Data Sheet