



SAFETY DATA SHEET

Z-5-MUSCENONE

Complying with 1907/2006/EEC Regulation of 18 December 2006 ("REACH Regulation") and REGULATION (EC) No 1272/2008 (CLP)

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

1.1 Product identifier

Product name: Z-5-MUSCENONE

Chemical name (e.g. IUPAC name): Z-3-methyl-cyclopentadec-5-en-1-one

Synonyms: cis-3-methyl-5-Cyclopentadecen-1-one

Trade Name: Z-5-MUSCENONE

Chemical formula: C₁₆H₂₈O

Product type: Liquid

CAS number: 21944-94-5

EC number: 429-900-5

Product code: 4399

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

Common/important uses of the substance/preparation:

In fine fragrance formulas.

1.3 Details of the supplier of the safety data sheet

Company/undertaking identification

AROMOR FLAVORS & FRAGRANCES LTD.

KIBBUTZ GIVAT-OZ 19225, ISRAEL

Tel: +972-4-6524900/1

Fax: +972-4-6425052

E-mail address of person responsible for this SDS: mrkt@aromor.com

1.4 Emergency telephone number

Emergency telephone number (including hours of operation):

Section 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification in accordance to Regulation (EC) No. 1272/2008 (CLP/GHS)

| Product name | GHS Classification |
|---------------------|---|
| Z-5-MUSCENONE | Skin Sens. 1 H317 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 |

Classification according to Directive 67/548/EEC (DSD) or 1999/45/EC

| Product name | EU Classification |
|---------------------|--------------------------|
| Z-5-MUSCENONE | Xi; R43 N; R50/53 |

2.2 Label elements

Labeling in accordance with Regulation 1272/2008 (CLP)

Hazard pictograms



Signal word: Warning

Hazard statements:

H317: May cause an allergic skin reaction

H400: Very toxic to aquatic life

H410: Very toxic to aquatic life with long lasting effects

Precautionary Statements

P261: Avoid breathing dust/fume/gas/mist/vapours/spray

P272: Contaminated work clothing should not be allowed out of the workplace

P273: Avoid release to the environment

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P391: Collect spillage

2.3 Other hazard

Substance meets the criteria for BBT according to Regulation (EC) No. 1907/2006, Annex XIII:

Not applicable

Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII:

Not applicable

Other hazard which do not result in classification:

Not applicable

Section 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/preparation:

| Product/ Ingredient name | Identifiers | % | EU Classification | GHS Classification |
|--------------------------|--|---------|----------------------|---|
| Z-5-MUSCENONE | CAS number: 21944-94-5 EC number: 429-900-5 | Min. 75 | Xi; R43 N; R50/53 | Skin Sens. 1 H317 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 |

There are no additional ingredients present which, within the current knowledge of the supplier

and in the concentrations applicable, are classified as hazardous to health or the environment and

hence require reporting in this section.

Occupational exposure limits, if available, are listed in section 8.

See section 16 for the full text of the H-statements and R-phrases declared above

Section 4. FIRST AID MEASURES

4.1 Description of first aid measures

Eyes contact: In case of contact with eyes rinse thoroughly with plenty of water for at least 15 minutes and seek medical advice.

Skin contact: In case of contact with skin wash off immediately with soap and plenty of water, and seek medical advice.

Inhalation: Remove the casualty into fresh air and keep him calm. Apply artificial respiration if necessary and get medical attention immediately.

Ingestion: Wash mouth thoroughly with plenty of water and give water to drink. Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed Irritation and corrosivity:

Inhalation: May be harmful by inhalation. Material may be irritating to mucous membranes and upper respiratory tract.

Ingestion: May be harmful by ingestions.

Skin contact: May cause skin irritation. May be harmful by skin absorption. May cause an allergic skin reaction.

Eyes contact: May cause eye irritation

Over-exposure sign/symptoms:

Eyes contact: N/A

Inhalation: N/A

Ingestion: N/A

Skin contact: N/A

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote, medical staff contacts Poisons Information Center. All treatments should be based on observed signs and symptoms of distress in the patient.

Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Special treatments: No specific treatment

Section 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable: For small fires, use dry chemical, carbon dioxide, alcohol resistant foam. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray.

Not suitable: Solid streams of water may be ineffective.

5.2 Special hazards arising from the substance or mixture

Emits toxic fumes under fire and carbon oxides (CO, CO₂).

5.3 Advice for firefighters

Special protective equipment for fire fighters: Fire fighters should wear full protective clothing and self-contained breathing apparatus in positive pressure mode.

Remark: Move containers from fire area if possible to do so without risk. Cool all affected containers with flooding quantities of water.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear protective clothing. Avoid contact with skin eyes and inhalation of vapors. Remove all sources of ignition. Ventilate area of spill.

6.2 Environmental precautions

Keep away from drains, surface and groundwater and soil.

6.3 Methods and materials for containment and cleaning up

Small spill: Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete disposed of according to the local regulations.

Large spill: As for small spill

Personal Protection in Case of Large Spill: Safety glasses. Full suit. Suitable respirator. Boots . Gloves. A self- contained breathing apparatus should be used to avoid inhalation of the product.

6.4 Reference to other sections

See Sections 1 for emergency contact information

See Section 8 for information on a appropriate personal protective equipment

See Section 13 for additional waste treatment information

Section 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Handling: Avoid contact with eyes, skin and clothing. Do not permit eating/drinking/smoking near the material. Avoid prolonged or repeated exposure.

Hygiene Measures: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also section 8 for additional information measures.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Keep containers tightly closed, in dry, cool and well-ventilated place. Protect from light. Keep away from heat, sparks and open flame. Do not store together with strong oxidizing agents. Containers should be nitrogen capped after use since oxygen and moisture absorption can cause flavor/odor degradation . Shelf life: 12 months.

7.3 Specific end use(s): N/A

Section 8: EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Control parameters

Occupational exposure limit values: N/A

Derived effects levels:

Recommended occupational and consumer exposure limit values (following from the preformed CSA):N/A

8.2 Exposure controls

Engineering Measures

Use process enclosures, local exhaust ventilation, or others engineering controls to keep airborne levels below recommend exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Person Protective measures

Occupational exposure controls:

Respiratory protection: Suitable respirator. Be sure to use an approved/certified or equivalent. Wear appropriate respirator when ventilation is inadequate.

Eye/face protection: Wear chemical safety goggles.

Skin protection:

Hand protection: Wear protective compatible chemical gloves.

Other: Wear appropriate long-sleeved clothing to minimize skin contact.

Hygiene measures: Keep away from foodstuffs and beverages. Do not eat, drink or smoke during work time. Remove soiled or soaked clothing immediately. Clean skin thoroughly after work; apply skin cream. During use, provide suitable ventilation.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance: Liquid, Colorless to pale yellow

Odour : strong, pure ,musk odor appreciated for better top note of MUSCENONE

Odour threshold: N/A

pH: N/A

Melting point/Freezing point: N/A

Initial boiling point/boiling range: N/A

Flash point: 100°C, closed cup
Evaporation rate: N/A
Flammability: N/A
Upper/lower flammability or explosive limits: N/A
Vapor pressure: N/A
Vapor density: N/A
Relative Density: 0.927-0.937 g/ml at 20°C
Solubility(ies) : In ethanol 95% in all proportions
Partition coefficient Octanol/Water: N/A
Auto-ignition temperature: N/A
Decomposition temperature: N/A
Viscosity: N/A
Explosive properties: N/A
Oxidizing properties: N/A

9.2 Other information:

Molecular weight: 236.39 g/mol
Refractive Index: 1.485-1.520 at 20°C
Acid Value: max. 1.0

Section 10: STABILITY AND REACTIVITY

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients

10.2 Chemical stability

The product is stable under normal handling and storage conditions described in section 7.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

Keep away from heat, sparks and open flame.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous Decomposition products:

Emits toxic fumes under fire and carbon oxides (CO, CO₂).

Section 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

| Product/ingredient name | Test | Species | Dose |
|--------------------------------|----------------------------|----------------|----------------------------|
| Z-5-MUSCENONE | LD50, Oral LD50, Dermal | Rat Rabbit | >2000 mg/kg >2000 ml/kg |

Irritation and corrosivity:

Inhalation: May be harmful by inhalation. Material may be irritating to mucous membranes and upper respiratory tract.

Ingestion: May be harmful by ingestions.

Skin contact: May cause skin irritation. May be harmful by skin absorption.

Eyes contact: May cause eye irritation.

Sensitization: May cause allergic skin reaction.

Chronic toxicity:

Carcinogenicity: N/A

Mutagenicity: N/A

Reproductive toxicity: N/A

Specific target organ toxicity (single exposure): N/A

Specific target organ toxicity (repeated exposure): N/A

Aspiration hazard: N/A

Other effects

Over exposure signs/symptoms: N/A

Target organs: N/A

Other effects

Over exposure signs/symptoms: N/A

Target organs: N/A

Section 12: ECOLOGICAL INFORMATION

12.1 Toxicity: N/A

12.2 Persistence and Degradability: N/A

12.3 Bioaccumulative potential: N/A

12.4 Mobility in soil

Soil/water partition coefficient (Koc) : N/A

12.5 Results of PBT and vPvB assessment

Not available

12.6 Other adverse effects

Substances which have an unfavorable influence on the oxygen balance and can be measured using parameters such as BOD, COD, etc.: N/A

Substances, which contribute to eutrophication: N/A

Section 13: DISPOSAL CONSIDERATIONS

Methods of disposal: Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Hazardous waste: N/A

Section 14: TRANSPORT INFORMATION

International transport regulations

| Regulatory Information | 14.1 UN number | 14.2 Proper shipping name | 14.3 Transport hazard class(es) | 14.4 Packing group | 14.5 Environmental hazard | 14.6 Special precautions for user | Additional information |
|-------------------------------|-----------------------|---|--|---------------------------|----------------------------------|--|-------------------------------|
| ADR/RID Class | 3082 | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Z-5-MUSCENONE) | 9 | III | - | - | EAC: 3Z |
| ADNR Class | 3082 | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Z-5-MUSCENONE) | 9 | III | - | - | - |
| IMDG class | 3082 | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Z-5-MUSCENONE) | 9 | III | - | - | EmS: F-A, S-F |
| IATA class | 3082 | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Z-5-MUSCENONE) | 9 | III | - | - | - |

14.7 Transport to bulk according to Annex II of MARPOL 79/78 and the IBC Code

Not applicable

Section 15: REGULATORY INFORMATION

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

EU Directives 67/548/EEC and 1999/45/EC (including amendments) and take into account the intended product use

EU Regulation(EC) No.1907/2006 (REACH), No 1272/2008 (CLP)

15.2 Chemical safety assessment

In accordance with REACH article 14, a Chemical Safety Assessment has been carried out for this substance.

Section 16: OTHER INFORMATION

Full text of R-phrases referred to in sections 2 and 3:

R43: May cause sensitization by skin contact.

R50/53: Very Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic.

Safety phrases:

S24: Avoid contact with skin.

S36/37: Wear suitable protective clothing and gloves.

S60: Avoid release to the environment. Refer to special instructions safety data sheet

S61: If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Full text of Hazards Statements referred to in sections 2 and 3:

H317: May cause an allergic skin reaction.

H400: Very toxic to aquatic life.

H410: Very toxic to aquatic life with long lasting effects.

| | | |
|--------|------------------|------------------------|
| Page:8 | 08.11.2012 :Date | MSDS FOR Z-5 MUSCENONE |
|--------|------------------|------------------------|

Precautionary Statements:

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P272: Contaminated work clothing should not be allowed out of the workplace.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P391: Collect spillage.

Training advice: Before using/handling the product one must read carefully present MSDS.

Recommended restriction: N/A

Key Legend Information:

ACGIH- American Conference of Governmental Industrial Hygienists

OSHA- Occupational Safety and Health Administration

NTP- National Toxicology program

IARC- International Agency for Research on Cancer

ND- Not Determined

N/A- Not available

R-phrases- Risk phrases

S-phrases- Safety phrases

Date of issue: 20th February 2011

Version no. 1

According to Regulation (EC) No. 1907/2006 (REACH), Annex II, Commission Directive 2001/59/EC and REGULATION (EC) No 1272/2008 (CLP).

To the best of our knowledge the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.