Safety Data Sheet

Organic Cinnamon Essential Oil - Leaf (Cinnamomum zeylanicum)

According to Article 31 of Regulation (EC) n°1907/2006

1 - IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

1.1 - Product identifier

Trade name: CINNAMON LEAF MADAGASCAR ORGANIC
Botanical name: Cinnamomum verum J.Presl (Syn : Cinnamomum zeylanicum Blume)
INCI name: CINNAMOMUM ZEYLANICUM LEAF OIL
N°CAS TSCA: 8015-91-6
N°CAS EINECS: 84649-98-9
N°EINECS (n°EC): 283-479-0
N°CoE: 133n
N°FEMA: 2292

1.2 - Relevant identified uses of the substance and uses advised against

Use of product: Fragrant and/or flavour substance (ONLY INDUSTRIAL USE)

1.3 - Details of the supplier

Name supplier: NHR Organic Oils
Address: 24 Chatham Place, Brighton, BN1 3TN, UK
Phone: +44 1273 746505
E-mail: info@nhrorganicoils.com

1.4 - Emergency telephone number

Information in the event of emergency: during the normal hours of opening (8h00 to 17h00) at 33 (0).468.741.789, if not to emergency number ORFILA at 33(0).145.42.59.59

2 - HAZARDS IDENTIFICATION

2.1 - Classification of the substance

2.1.1 - Classification according to Regulation (EC) n°1272/2008

<table>
<thead>
<tr>
<th>Classification</th>
<th>R</th>
<th>I</th>
<th>H</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Irrit. 2 ( EDI 2 )</td>
<td></td>
<td></td>
<td>H319</td>
<td>Cause serious eye irritation.</td>
</tr>
<tr>
<td>Skin Sens. 1 ( SS 1 )</td>
<td></td>
<td></td>
<td>H317</td>
<td>May cause an allergic skin reaction.</td>
</tr>
<tr>
<td>Carc. 1B ( CAR 1B )</td>
<td></td>
<td></td>
<td>H350</td>
<td>May cause cancer.</td>
</tr>
<tr>
<td>Muta. 2 ( MUT 2 )</td>
<td></td>
<td></td>
<td>H341</td>
<td>Suspected of causing genetic defects.</td>
</tr>
</tbody>
</table>

Classification procedure established according to the current IFRA* / IOFI* Labelling Manual and all ingredients classified according to Regulation (EC) n°1272/2008

2.1.2 - Classification according to Directive n°67/548/EEC

T Toxic
R36 Irritating to eyes
R43 May cause sensitisation by skin contact
R45 May cause cancer
R68  Possible risk of irreversible effects

2.1.3 - Additional information


Information taken from specialist publications and information in the company's possession is also taken into account.

Other hazards: See the recommendations concerning the storage of classified products.

For the full text of risk phrases, hazard classes and categories, and H and EUH hazard statements, see section 16.

2.2 - Labelling elements

<table>
<thead>
<tr>
<th>HAZARD PICTOGRAM(S)</th>
<th>HAZARD STATEMENT(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHS07</td>
<td>H317  May cause an allergic skin reaction.</td>
</tr>
<tr>
<td>GHS08</td>
<td>H319  Cause serious eye irritation.</td>
</tr>
<tr>
<td></td>
<td>H341  Suspected of causing genetic defects.</td>
</tr>
<tr>
<td></td>
<td>H350  May cause cancer.</td>
</tr>
</tbody>
</table>

SIGNAL WORD

Danger

PRECAUTIONARY STATEMENT(S)

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

P302 + P352  IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P313  IF exposed or concerned: Get medical advice, attention.

P309 + P311  IF exposed or if you feel unwell: Call a POISON CENTER or doctor, physician.

P501  Dispose of contents/the container in accordance with current legislation.

ADDITIONAL HAZARD INFORMATION(S)

Not regulated

2.3 - Other hazards

CMR* substances not requiring classification: None

Allergens (according to Cosmetic Directive 2003/15/EC): Eugenol (<= 85,00 %), Benzyl benzoate (<= 7,00 %), Linalool (<= 3,50 %), Cinnamal (Cinnamaldehyde) (<= 3,00 %), Cinnamyl alcohol (<= 1,00 %), D-Limonene (<= 1,00 %)

3 - COMPOSITION / INFORMATION ON INGREDIENTS

3.1 - Type of product

Matter: NCS, Natural Complex Substance (100% pure and natural), Essential Oil.

Agro-alimentary Organic product certified by FR-BIO-01

3.2 - Dangerous ingredients

3.2.1 - Classification according to Regulation (EC) n°1272/2008

<table>
<thead>
<tr>
<th>N°CAS</th>
<th>N°EINECS</th>
<th>Eugenol</th>
</tr>
</thead>
<tbody>
<tr>
<td>97-53-0</td>
<td>202-589-1</td>
<td>&lt;= 85,00 %</td>
</tr>
</tbody>
</table>

Eye Irrit. 2, H319; Skin Sens. 1, H317
<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Compound</th>
<th>Maximum Concentration</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>93-28-7</td>
<td>Eugenol</td>
<td>&lt;= 85.00 %</td>
<td>Xi, R36, R43</td>
</tr>
<tr>
<td>93-28-7</td>
<td>Eugenyl acetate</td>
<td>&lt;= 8.00 %</td>
<td>Xn, R22</td>
</tr>
<tr>
<td>120-51-4</td>
<td>Benzyl benzoate</td>
<td>&lt;= 7.00 %</td>
<td>N, Xn, R22, R51/53</td>
</tr>
<tr>
<td>87-44-5</td>
<td>Beta caryophyllene</td>
<td>&lt;= 7.00 %</td>
<td>Xn, R65</td>
</tr>
<tr>
<td>99-83-2</td>
<td>Alpha phellandrene</td>
<td>&lt;= 4.00 %</td>
<td></td>
</tr>
</tbody>
</table>

3.2.2 - Classification according to Directive n° 67/548/EEC
For further details regarding symptoms and effect on health, see section 11.

### 3.3 - Additional information

For the full text of risk phrases, safety phrases, hazard classes and categories, and H and EUH hazard statements, see section 16.

### 4 - FIRST AID MEASURES

#### 4.1 - Description of first aid measures required

- **Excessive inhalation**: Remove victim to fresh air. Keep them warm and allow them to rest quietly. If harmful effects persist or worsen, call a doctor. If patient is unconscious, place them in the lateral recovery position and call a doctor immediately. Make sure the area is well ventilated.

- **Skin contact**: Rinse with plenty of water and change clothing if necessary. If irritation persists or if skin lesions of any kind appear, seek medical advice.

- **Eye contact**: Rinse immediately with plenty of running water (minimum 2 litres), opening the eyes wide under the tap. If possible, lift the upper eyelid and rinse. If irritation persists or if skin lesions of any kind appear, consult an eye specialist, taking the product with you. If you wear contact lenses, rinse your eyes immediately. The lenses will probably fall out during rinsing. If not, remove them after rinsing. Do not put them back in. If you wear soft contact lenses, throw them away even if new. Hard contact lenses may be used again after proper cleaning by an eyecare professional. In all cases, do not wear contact lenses after the accident without the advice of an eye specialist.

- **Ingestion**: Rinse the mouth out with water. Remove victim to fresh air. Keep them warm and allow them to rest quietly. Do not induce vomiting unless otherwise directed by a medical professional. If vomiting occurs spontaneously, keep head low down to prevent aspiration into the lungs. If harmful effects persist or worsen, call a doctor. If patient is unconscious, place them in the lateral recovery position and call a doctor immediately. Make sure the area is well ventilated.

In general, in case of doubt or if symptoms persist, ask for medical advice. Never give anything by ingestion to an unconscious person. It is recommended that those who provide first aid have a personal protective equipment. Any initiative must be taken which involves an individual risk or in the absence of appropriate training.

#### 4.2 - Most important, acute or delayed symptoms/effects

For further details regarding symptoms and effect on health, see section 11.

#### 4.3 - Information regarding emergency medical care or special treatment

No special treatment necessary. Symptomatic treatment required. Contact a poison specialist immediately if large quantities have been ingested or inhaled.
5 - FIRE-FIGHTING MEASURES

5.1 - Extinguishing media

Suitable extinguishing media: Carbon dioxide (CO2) or powder fire extinguisher (ABC Classes), foam extinguisher.

Unsuitable extinguishing media: Direct jet of water.

5.2 - Special hazards arising from the substance

Possible production of toxic fumes under fire.

5.3 - Advice to fire-fighters

Avoid breathing in vapour or smoke emitted. Use a mask if necessary.
Do not attempt to fight the fire with water, which tends to feed rather than smother the flames. Essential oils have the ability to float on water and this causes the fire to propagate more quickly. To put out an essential oil-based fire in its early stages, use a specific ABC dry powder fire extinguisher (or equivalent). Small fires can be smothered by covering with earth, sand or a blanket.

6 - ACCIDENTAL RELEASE MEASURES

6.1 - Personal safety precautions, protective equipment and emergency procedures

Remove all possible ignition sources. Ventilate the premises. Do not smoke.

6.2 - Environmental protection precautions

Avoid contaminating the drainage system, surface water or ground water. Dispose of any contaminated cloths, sponges, etc. in accordance with the regulatory instructions in force.

6.3 - Containment and cleaning methods and equipment

Large spills must first be absorbed with inert material which must then be swept up and disposed of in accordance with the regulations in force.

6.4 - Reference to other sections

For personal protection, see section 8.
For waste disposal, see section 13.

7 - HANDLING AND STORAGE

7.1 - Precautions for safe handling

7.1.1 - Recommendations

a) Personal precautions: Avoid contact, do not inhale hot vapour, do not ingest, work under an extraction hood or arm. Evacuate all unnecessary personnel not wearing protective clothing. Do not touch or step in the spilled product. Ensure adequate ventilation. If the ventilation system is inadequate, wear an appropriate respiratory protection device.

b) Incompatibilities: Keep in original container or other approved container made from a compatible material and keep tightly closed when not in use. Do not reuse empty containers as they can hold product residues.

c) Environment: Avoid discharge into the environment. Work in containment area. Use an appropriate container to avoid contaminating the surrounding environment.

7.1.2 - Hygiene rules

It is forbidden to eat, drink or smoke in areas where this product is handled, stored or used. Personnel are recommended to wash their hands after using the product and remove contaminated clothing and protective equipment before entering eating or rest areas or toilets.

7.2 - Safe storage taking all incompatibilities into account

a) How to avoid creating:

i) explosive atmospheres: No risk at ambient temperature: observe ATEX® requirements.

ii) corrosive conditions: Store in stainless steel or amber glass containers if possible

iii) a fire hazard: Do not heat over a naked flame; do not expose the vapours to a naked flame or any other ignition source. Do not smoke while handling the product. During incorporation, the product must be kept at a relatively low temperature. If it is necessary to raise the temperature, this must be done with caution and for as short a time as possible.

iv) storing with incompatible substances or mixtures: Label according to the regulations in force, refer to chemical incompatibility table (INRS® Storage and transfer of hazardous chemicals).

v) evaporation conditions: Store in closed containers protected from heat and light. Opened containers must be carefully reclosed and kept upright to avoid leakage.

vi) potential ignition sources (including electrical equipment): Hot surfaces, naked flames, hot gases, mechanically produced sparks and ionizing radiation should be kept to a minimum or avoided completely. Have electrical equipment and wiring checked periodically by an approved electrician. Avoid static discharge by earthing your metal appliances. Protect electrical equipment from lightning by installing a lightning arrester.
b) How to control the effects of:
   i) weather conditions: Do not store outside.
   ii) ambient pressure: No known hazard.
   iii) temperature: Store in a temperate area; to avoid drastic differences in temperature, insulate the facility as much as possible or store in a cold room.
   iv) solar radiation: Store in opaque containers (preferably stainless steel or amber glass).
   v) humidity: Store in properly closed containers.
   vi) vibration: Store in strong, properly closed containers.

c) How to preserve the integrity of the substance using:
   i) stabilizers: Store under a nitrogen blanket if possible.
   ii) antioxidants: An antioxidant may be added; see regulations in force.

d) Other points:
   i) ventilation requirements: See regulations in force. Good overall ventilation should be sufficient to limit the operator's exposure to molecules suspended in the air.
   ii) the specific design of storage rooms and tanks: See regulations in force.
   iii) maximum storable quantities: See regulations in force.
   iv) packaging compatibility: Avoid PVC.

7.3 - Specific end use(s)
Comply with the regulations and product data sheet. No specific recommendations. Apply the above handling guidelines.

8 - EXPOSURE CONTROL - PERSONAL PROTECTION

8.1 - Control parameters

Not regulated. No specific exposure limits for this product.

8.1.2 - Biological limit values (database of chemicals GESTIS: www.dguv.de)
Not regulated. No biological limit values established for this product.

8.1.3 - Recommended monitoring procedures
If this product contains ingredients involving exposure limits, it may be necessary to carry out regular tests on the atmosphere in the work area as well as on people and other living organisms, to determine the effectiveness of the ventilation, or other checks, or assess the need to use respirators. It is important to refer to European standard EN 689 which gives the methods for assessing exposure to chemical agents by inhalation and national general policy documents relating to the methods for determining dangerous substances.

8.1.4 - DNEL* (section 1.4 appendix I) / PNEC* (section 3.3 appendix I)
A chemical safety report (CSR) is not required according to the regulations. DNEL* and PNEC* are therefore not applicable to this product.

8.1.5 - Risk management measures according to used control banding approach (ICCT*)
If necessary refer to the website: www.ilo.org

<table>
<thead>
<tr>
<th>Task</th>
<th>Hazard band</th>
<th>Scale of use</th>
<th>Ability to become airborne</th>
<th>Control approach</th>
<th>Control Guidance Sheets</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

8.2 - Exposure control

8.2.1 - Appropriate technical control
Maintain concentration levels in the air below the occupational exposure limits defined in the standards.
Utilize localized extraction equipment.
Make use of mechanical handling equipment to reduce human contact with the products.
8.2.2 - Personal protection measures

a) Eye and face protection: Protective glasses or goggles should be worn.
b) Skin protection: Waterproof gloves that are resistant to essential oils and comply with an approved standard should be worn (nitrile rubber or polyvinyl alcohol (PVA)).
c) Respiratory protection: Not generally necessary if the area is well ventilated (unless otherwise indicated).
d) Heat exposure hazards: Exposure to a heat flux from a fire or explosion can cause burns of varying degrees, depending on the distance from the heat source. It is essential to wear appropriate protective equipment as well as an autonomous respiratory protection device.

8.2.3 - Exposure control related to environmental protection

Comply with local environmental protection laws.

9 - PHYSICAL AND CHEMICAL PROPERTIES

9.1 - Information on physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Appearance</td>
<td>Liquid</td>
<td>internal</td>
</tr>
<tr>
<td>b) Color</td>
<td>Clear yellow to amber yellow</td>
<td>internal</td>
</tr>
<tr>
<td>c) Odour</td>
<td>Spicy, sweet with a note of clove</td>
<td>internal</td>
</tr>
<tr>
<td>d) pH (20 °C)</td>
<td>Not applicable</td>
<td>/</td>
</tr>
<tr>
<td>e) Melting point</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>f) Initial boiling point and boiling range</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>g) Flash point</td>
<td>+94 °C</td>
<td>FD ISO/TR 11018 (vacuum)</td>
</tr>
<tr>
<td>h) Evaporation rate (butyl acetate = 1)</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>i) Flammability</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>j) Upper / lower flammability</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>k) Vapor pressure at 25 °C</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>l) Density of vapor (air = 1)</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>m) Relative density at 20 °C</td>
<td>1,030 to 1,059</td>
<td>NF ISO 279</td>
</tr>
<tr>
<td>n) Solubilities</td>
<td></td>
<td>/</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Insoluble</td>
<td>/</td>
</tr>
<tr>
<td>Alcohol solubility (20 °C in g/l)</td>
<td>Soluble</td>
<td>NF ISO 875</td>
</tr>
<tr>
<td>o) Partition coefficient : n-Octanol/Water (log Po/w)</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>p) Auto ignition temperature</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>q) Decomposition temperature</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>r) Viscosity</td>
<td>Not available</td>
<td>/</td>
</tr>
<tr>
<td>s) Explosive properties</td>
<td></td>
<td>/</td>
</tr>
<tr>
<td>Lower limit : Not available</td>
<td></td>
<td>/</td>
</tr>
<tr>
<td>Upper limit : Not available</td>
<td></td>
<td>/</td>
</tr>
<tr>
<td>Explosion hazards : No risk at room temperature, comply to ATEX requirements.</td>
<td>/</td>
<td></td>
</tr>
<tr>
<td>t) Combustions properties</td>
<td>Does not contain any substance known to be susceptible to self-ignite</td>
<td>/</td>
</tr>
</tbody>
</table>
9.2 - Other information

<table>
<thead>
<tr>
<th>Value</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refractive index at 20°C</td>
<td>1.527 to 1.540</td>
</tr>
<tr>
<td>Optical rotation at 20°C</td>
<td>-3 ° to +4 °</td>
</tr>
</tbody>
</table>

Main ingredients

<table>
<thead>
<tr>
<th>Value</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eugenol (&lt;= 85.00%)</td>
<td>GC*</td>
</tr>
<tr>
<td>Eugenyl acetate (&lt;= 8.00%)</td>
<td></td>
</tr>
<tr>
<td>Benzyl benzoate (&lt;= 7.00%)</td>
<td></td>
</tr>
<tr>
<td>Beta caryophyllene (1.50 to 7.00%)</td>
<td></td>
</tr>
<tr>
<td>Cinnamal (Cinnamaldehyde) (&lt;= 3.00%)</td>
<td></td>
</tr>
</tbody>
</table>

10 - STABILITY AND REACTIVITY

10.1 - Reactivity
This product is shock-, vibration- and pressure-resistant under normal usage conditions.
Exposure to light or heat may cause oxidation.

10.2 - Chemical stability
No significant change in composition over time if the storage conditions described in paragraph 7.2 are observed.

10.3 - Possibility of dangerous reactions
None to our knowledge under normal usage conditions.

10.4 - Condition to avoid
Do not heat to a high temperature. Do not expose closed containers to direct sunlight. Keep away from ignition sources.

10.5 - Incompatible materials
P.V.C.

10.6 - Dangerous product decomposition
The product does not decompose under normal usage conditions.

11 - TOXICOLOGICAL INFORMATION

Hazards assessed using the methods described in Regulation (EC) No 1272/2008 and appendices for the case of complex natural substances and / or mixtures. They are also complemented by the RIFM* monographs, INRS* and IFRA *.

11.1 - Reactivity

a) Acute toxicity

<table>
<thead>
<tr>
<th>Effect dose</th>
<th>Value</th>
<th>Methods</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral ingestion</td>
<td>LD50 org.</td>
<td>2 700 mg/kg</td>
<td>Oral ingestion in rats</td>
</tr>
<tr>
<td>Dermal absorption</td>
<td>LD50 derm.</td>
<td>&gt;= 5 000 mg/kg</td>
<td>Dermal application in rabbits</td>
</tr>
</tbody>
</table>
| Inhalation | LC50 | N.A. | / | /

b) Skin corrosion / irritation
No significant effects or critical hazards.

c) Serious eye damage / irritation
Cause serious eye irritation.

d) Respiratory or skin sensitisation
May cause an allergic skin reaction.

e) Germ cell mutagenicity
Suspected of causing genetic defects.

f) Carcinogenicity
May cause cancer.

g) Toxicity for reproduction
No significant effects or critical hazards.
h) STOT - single exposure

<table>
<thead>
<tr>
<th>Single exposure</th>
<th>Specific effects</th>
<th>Affected organs</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute oral toxicity</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Acute dermal toxicity</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Acute inhalative toxicity</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
</tbody>
</table>

i) STOT - repeated exposure

<table>
<thead>
<tr>
<th>Repeated exposure</th>
<th>Specific effects</th>
<th>Affected organs</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-acute oral</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Sub-acute dermal</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Sub-acute inhalative</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Sub-chronic oral</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Sub-chronic dermal</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Sub-chronic inhalative</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Chronic oral</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Chronic dermal</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Chronic inhalative</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
</tbody>
</table>

j) Aspiration hazard

No significant effects or critical hazards.

11.2 - Information on the likely routes of exposure

No specific data.

11.3 - Symptoms related to physical, chemical and toxicological

No specific data.

11.4 - Delayed, immediate and chronic effects of short- and long-term

No specific data.

11.5 - Interactive effects

No specific data.

11.6 - Information on ingredients

CMR*: Safrole (<=4,00%) 

11.7 - Other information

This substance and/or some of its components are covered by the Code of Practice of the IFRA in effect, available on the internet website www.ifraorg.org

11.8 - Important comment

None

12 - ECOLOGICAL INFORMATION

12.1 - Toxicity

a) Danger to the aquatic environment according to Regulation (EC) n°1272/2008

Not regulated

b) Aquatic toxicity

<table>
<thead>
<tr>
<th>Aquatic toxicity</th>
<th>Effect dose</th>
<th>Exposure time</th>
<th>Results</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute fish toxicity</td>
<td>LC50</td>
<td>96h</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Acute daphnia toxicity</td>
<td>EC50</td>
<td>48h</td>
<td>Not available</td>
<td>Acute immobilisation test</td>
</tr>
<tr>
<td>Acute algae toxicity</td>
<td>IC50</td>
<td>72h</td>
<td>N.A.</td>
<td>/</td>
</tr>
</tbody>
</table>
c) Longterm-ecotoxicity

<table>
<thead>
<tr>
<th>Longterm-ecotoxicity</th>
<th>Effect dose</th>
<th>Exposure time</th>
<th>Results</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longterm fish toxicity</td>
<td>LC50</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Chronic daphnia toxicity</td>
<td>EC50</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
</tbody>
</table>

12.2 - Persistence and degradability

a) Abiotic degradation

<table>
<thead>
<tr>
<th>Half time</th>
<th>Evaluation</th>
<th>Methods</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sea-water</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Fresh water</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Air</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Soil</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
</tbody>
</table>

b) Biodegradation

<table>
<thead>
<tr>
<th>Degradation rate (%)</th>
<th>Time</th>
<th>Evaluation</th>
<th>Methods</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
</tbody>
</table>

12.3 - Bioaccumulative potential

a) Partition coefficient n-octanol / water (log Ko/w)

<table>
<thead>
<tr>
<th>Value</th>
<th>Concentration</th>
<th>pH</th>
<th>°C</th>
<th>Methods</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
</tbody>
</table>

b) Bioconcentration factor (BCF)

<table>
<thead>
<tr>
<th>Value</th>
<th>Species</th>
<th>Evaluation</th>
<th>Methods</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
</tbody>
</table>

12.4 - Mobility in soil

a) Surface tension

<table>
<thead>
<tr>
<th>Value</th>
<th>°C</th>
<th>Concentration</th>
<th>Methods</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
<td>/</td>
</tr>
</tbody>
</table>

b) Adsorption / Desorption

<table>
<thead>
<tr>
<th>Transport</th>
<th>A/D coefficient Henry constant</th>
<th>log Koc</th>
<th>Volatility rate</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil - Water</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Water-Air</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
<tr>
<td>Soil-Air</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>/</td>
</tr>
</tbody>
</table>

12.5 - Results of PBT* and vPvB* assessment

To our knowledge, no such assessment has been carried out on this product to date.

12.6 - Other adverse effects

Water hazardous class (WGK*) according to Annex 2 of the German directive Hazardous Materials (No. carac.: 814; 17.05.1999 organics materials): 2
13 - DISPOSAL CONSIDERATIONS

13.1 - Waste treatment methods
Do not discharge into drainage systems or watercourses. Waste should be recycled or disposed of according to the legislation in force, preferably by an approved recycling or waste treatment company. Do not pollute the soil or water; do not dispose of waste in the environment. Empty containers completely. Do not remove labels. Use an approved waste disposal company.

13.2 - Additional information
The regulations relating to waste are codified in the French Environmental Code, according to Act No 2000-914 of 18 September 2000 relating to the legislative part of the Environmental Code. The text of Articles L. 541-1 to L. 541-50 is found in Book V (Prevention of pollution, risks and nuisances), Section IV (Waste), Chapter I (Waste disposal and materials recovery).

14 - TRANSPORT INFORMATION
Comply with international dangerous goods regulations in force.

14.1 - ADR*

<table>
<thead>
<tr>
<th>ADR/RID Class</th>
<th>NOT REGULATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>N°UN</td>
<td>NOT REGULATED</td>
</tr>
<tr>
<td>Packing group</td>
<td>NOT REGULATED</td>
</tr>
<tr>
<td>Dispatch Name</td>
<td>NOT REGULATED</td>
</tr>
<tr>
<td>Code Tunnel</td>
<td>NOT REGULATED</td>
</tr>
</tbody>
</table>

14.2 - IMDG*

<table>
<thead>
<tr>
<th>IMDG Class</th>
<th>NOT REGULATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>N°UN</td>
<td>NOT REGULATED</td>
</tr>
<tr>
<td>Packing group</td>
<td>NOT REGULATED</td>
</tr>
<tr>
<td>Dispatch Name</td>
<td>NOT REGULATED</td>
</tr>
</tbody>
</table>

| Marine pollutant | No |

14.3 - IATA*

<table>
<thead>
<tr>
<th>ICAO/IATA Class</th>
<th>NOT REGULATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>N°UN</td>
<td>NOT REGULATED</td>
</tr>
<tr>
<td>Packing group</td>
<td>NOT REGULATED</td>
</tr>
<tr>
<td>Dispatch Name</td>
<td>NOT REGULATED</td>
</tr>
</tbody>
</table>

14.4 - Specific precautions for the user
Guidelines on loading goods for carriage by road:
- See Table 7.5.2 of the ADR* for mixed loading prohibitions.
- Precautions relating to foodstuffs, other consumer goods and animal feed.
- During loading operations, smoking is prohibited in and around the vehicles.
- Check that the goods are properly secured in the vehicle.
- Check that the driver has the safety regulations and mandatory equipment if the limits defined by the ADR* are exceeded.

14.5 - Carriage in bulk in accordance with Appendix II of Marpol 73/78 and the IBC Code

Not applicable

14.6 - Additional information

Customs rate code : 3301 29 41 00

Comment: The regulatory provisions given above are those in force when the data sheet was updated. However, since the regulations governing the carriage of hazardous substances are always subject to change, if the MSDS in your possession is more than 12 months old, you are advised to consult your safety adviser to ensure validity.

15 - REGULATORY INFORMATION

15.1 - Specific health, safety and environment regulations/legislation

a) Special provisions

Legislation relating to facilities classified for environmental protection purposes (ICPE) in France.

Table of occupational illnesses covered by Article R. 461-3 of the French labour code: Table No 84 -Conditions induced by liquid organic solvents used in the workplace.

b) Notes

The regulatory information given in this section is intended merely as a reminder of the main provisions that apply specifically to the product covered by the MSDS.

The original EU texts mentioned are updated and transcribed into national law.

You are recommended to refer to all local, national and international measures and provisions that might apply.

You are alerted to the possible existence of provisions other than those referred to in this document.

15.2 - Chemical safety assessment

To our knowledge, no such assessment has been carried out on this product to date.

16 - OTHER INFORMATION

a) Latest changes

The content of the MSDS is regulated by the article 31 of the Regulation (EC) n°1907/2006 (REACH). This version has been completely updated according to the Regulation (EC) n°453/2010 of 20/05/2010.

MODIFICATION(S):

1) IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY
   => Botanical name

3) COMPOSITION / INFORMATION ON INGREDIENTS
   => Dangerous ingredients

9) PHYSICAL AND CHEMICAL PROPERTIES
   => Odor, Main ingredients, Optical rotation, Relative density, Refractive index

b) Abbreviations

ADR/RID : Agreement on Dangerous Goods by Road / Regulations concerning the Intl Transport of Dangerous Goods by Rail
ATEX : European explosive atmospheres directive
CLP : Classification Labelling Packaging
CMR : Carcinogenic, Mutagenic, Reprotoxic
DNEL : Derived No Effect Level
DSD : Dangerous Substances Directive
IATA-DGR : International Air Transport Association - Dangerous Goods Regulations
ICCT : Ilo Chemical Control Toolkit
ICAO-TI : International Civil Aviation Organization - Technical Instructions
IFRA : International Fragrance Association
IMDG : International Maritime Dangerous Goods
INRS : Institut National de Recherche et de Sécurité
IOFI : International Organization of the Flavor Industry
GC : Gas Chromatography
PBT : Persistent Bioaccumulating Toxicants
PNEC : Predicted No Effect Concentration
RIFM : Research Institute for Fragrance Materials
STOT : Specific Target Organ Toxicity
vPvB : Very Persistent and Very Bioaccumulative substance
c) References

This Material Safety Data Sheet has been issued is in compliance with:

- The IFRA* / IOFI* Labelling Manual of September 23, 2010
- The Directives 67/548/EEC and 1999/45/EC
- The Guidance on the compilation of Safety Data Sheet (ECHA - Draft October 2010)

d) Methods used in the assessment of data (Article 9 of Regulation (EC) n°1272/2008)

Classification established according to the current IFRA* / IOFI* Labelling Manual and all ingredients classified according to Regulation (EC) No 1272/2008.

e) List of risk phrases, safety phrases, classes and hazard categories, hazard statements and precautionary statements important

List of risk phrases (Directive n°67/548/EEC)

R21 : Harmful in contact with skin
R22 : Harmful if swallowed
R36 : Irritating to eyes
R38 : Irritating to skin
R43 : May cause sensitisation by skin contact
R45 : May cause cancer
R50/53 : Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R51/53 : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R65 : Harmful: may cause lung damage if swallowed
R68 : Possible risk of irreversible effects

List of safety phrases (Directive n°67/548/EEC)

S24 : Avoid contact with skin
S26 : In case of contact with eyes, rinse immediately with vegetable oil and seek medical advice
S37 : Wear suitable gloves
S45 : In case of accident or if you feel unwell seek medical advice immediately (show the label where possible)
S53 : Avoid exposure - obtain special instructions before use

List of classes and categories of danger (Regulation (EC) n°1272/2008)

Flam. Liq. 3 : Flammable liquid cat. 3
Acute Tox. 4 : Acute toxicity, oral cat. 4
Acute Tox. 4 : Acute toxicity, dermal cat. 4
Asp. Tox. 1 : Aspiration hazard cat. 1
Skin Irrit. 2 : Skin irritation cat. 2
Eye Irrit. 2 : Eye irritation cat. 2
Skin Sens. 1 : Skin sensitization cat. 1
Carc. 1B : Carcinogenicity cat. 1B
Muta. 2 : Germ cell mutagenicity cat. 2
Aquatic Acute 1, Aquatic Chronic 1 : Hazardous to aquatic environment - Acute hazard cat. 1 - Chronic hazard cat. 1
Aquatic Chronic 2 : Hazardous to aquatic environment - Chronic hazard cat. 2

List of hazard (Regulation (EC) n°1272/2008)

H226 : Flammable liquid and vapour.
H302 : Harmful if swallowed.
H304 : May be fatal if swallowed and enters airways.
H312 : Harmful in contact with skin.
H315 : Causes skin irritation.
H317 : May cause an allergic skin reaction.
H319 : Cause serious eye irritation.
H341 : Suspected of causing genetic defects.
H350 : May cause cancer.
H410 : Very toxic to aquatic life with long lasting effects.
H411 : Toxic to aquatic life with long lasting effects.

List of precautionary statements (Regulation (EC) n°1272/2008)

P280 : Wear protective gloves/protective clothing/eye protection/face protection.
P302 + P352 : IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 : IF exposed or concerned: Get medical advice, attention.
P309 + P311 : IF exposed or if you feel unwell: Call a POISON CENTER or doctor, physician.
P501 : Dispose of contents/the container in accordance with current legislation.

f) Advice on any appropriate training

Read the safety data sheet before using the product.

This MSDS complements the sheets in use, but does not replace them. The information it contains is based on the state of our knowledge about the product concerned at the time of update. They are given in good faith.
The attention of users is also drawn to the risks, if any, where a product is used for other purposes than those for which it was designed.
In no way is a user dispensed from knowing and applying the written regulations in the use of the product.
All regulatory requirements mentioned merely intend to help the user to fulfil their obligations when using a dangerous product.
This list should not be considered exhaustive. It does not dispense the user to ensure that no other obligations lie on him because of texts other than those cited and regulating the possession and use of the product, for which he alone is responsible.

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