

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Linalool
 Substance name : 3,7-Dimethyl-1,6-octadien-3-ol
 CAS-No. : 78-70-6

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

Use of the Sub- : Ingredient for fragrances, Ingredient for flavours
 stance/Mixture

1.3 Details of the supplier of the safety data sheet

Company : DSM Nutritional Products Ltd.
 PO Box 2676
 CH-4002 Basel
 Telephone : +41618158888
 Telefax : +41618157253
 E-mail address Respon- : sds.nutritionalproducts@dsm.com
 sible/issuing person

1.4 Emergency telephone number

+41 62 866 2314

SECTION 2. HAZARDS IDENTIFICATION**Emergency Overview**

CAUTION	
Appearance	clear liquid
Colour	colourless
Odour	floral

GHS Classification

Flammable liquids : Category 4
 Skin irritation : Category 2
 Eye irritation : Category 2A

GHS Label element

Hazard pictograms :



Signal word : Warning

Hazard statements : H227 Combustible liquid.
 H315 Causes skin irritation.
 H319 Causes serious eye irritation.

Precautionary statements : **Prevention:**
 P264 Wash skin thoroughly after handling.
 P280 Wear protective gloves/ eye protection/ face protection.

Response:

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.

P332 + P313 If skin irritation occurs: Get medical advice/ attention.

P337 + P313 If eye irritation persists: Get medical advice/ attention.

P362 Take off contaminated clothing and wash before reuse.

Potential Health Effects

Primary Routes of Entry : Skin Absorption

Skin : May cause skin irritation.

Eyes : May cause eye irritation.

Aggravated Medical Condition : None known.

Symptoms of Overexposure : Drowsiness, Disorders of the central nervous system, Respiratory disorders

Carcinogenicity:**IARC**

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

OSHA

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Additional hazards and advice

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Linalyl alcohol
 1,6-Octadien-3-ol, 3,7-dimethyl-LL

Brief description of the product : Substance

Molecular formula : C10-H18-O

Hazardous components

Component	CAS-No.	Weight percent
linalool	78-70-6	90 - 100

SECTION 4. FIRST AID MEASURES

- General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
- If inhaled : Move to fresh air.
Consult a physician after significant exposure.
- In case of skin contact : Take off contaminated clothing and shoes immediately.
Wash off with soap and plenty of water.
If symptoms persist, call a physician.
- In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Clean mouth with water and drink afterwards plenty of water.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
Obtain medical attention.
- Most important symptoms and effects, both acute and delayed : Drowsiness, Disorders of the central nervous system, Respiratory disorders
- Notes to physician : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES**Flammable properties**

- Flash point : 171.0 °F (77.2 °C)
at 1,013 hPa (101,300 mm/HG)
Method: ISO 2719
- Ignition temperature : 260 °C (at 994 hPa, DIN 51794)
- Lower explosion limit : 0.9 %(V)
- Upper explosion limit : 5.2 %(V)

Fire fighting

- Suitable extinguishing media : Alcohol-resistant foam
Dry chemical
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Unsuitable extinguishing media : High volume water jet

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Further information : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Protective equipment and precautions for firefighters

Specific hazards during fire-fighting : None known.

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Ensure adequate ventilation.

Environmental precautions : Try to prevent the material from entering drains or water courses.

Methods and materials for containment and cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : Provide sufficient air exchange and/or exhaust in work rooms.

Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.

Advice on protection against fire and explosion : Take necessary action to avoid static electricity discharge.
Product will burn under fire conditions.

Conditions for safe storage : Keep under inert gas.
Protect against light.
Protect from humidity.

Keep container tightly closed and dry.

Storage temperature : < 77 °F (< 25 °C)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection : In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit.

In the case of vapour formation use a respirator with an approved filter.

Hand protection	: Glove material: for example nitrile rubber Consider the hazard characteristics of this product and any special workplace conditions when selecting the appropriate type of protective gloves.
Eye protection	: Safety glasses with side-shields
Skin and body protection	: Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Hygiene measures	: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	: clear liquid
Colour	: colourless
Odour	: floral
Odour Threshold	: No information available.
pH	: 4.5 (1.45 g/l, 25 °C)
Freezing point	: < -74 °C (OECD Test Guideline 102)
Boiling point/boiling range	: 196.3 °C (at 992 hPa; OECD Test Guideline 103)
Flash point	: 77.2 °C (1,013 hPa, ISO 2719)
Evaporation rate	: not determined
Lower explosion limit	: 0.9 %(V)
Upper explosion limit	: 5.2 %(V)
Vapour pressure	: 0.273 hPa (at 25 °C)
Relative vapour density	: not determined
Density	: 0.859 - 0.863 g/cm ³ (at 20 °C) 0.858 g/cm ³ (at 25 °C; OECD Test Guideline 109)
Water solubility	: 1.47 - 1.65 g/l (25 °C) slightly soluble
Solubility in other solvents	: various organic solvents: soluble
Partition coefficient: n-octanol/water	: log Pow 2.9 (20 °C; OECD Test Guideline 107)
Auto-ignition temperature	: not pyrophoric
Ignition temperature	: 260 °C (at 994 hPa, DIN 51794)
Thermal decomposition	: Not relevant
Viscosity, dynamic	: 4.465 mPa.s (at 25 °C, OECD Test Guideline 114)
Explosive properties	: Not explosive

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Oxidizing properties : Not oxidizing

9.2 Other information

Refractive index : 1.460 - 1.464 (589 nm, 20 °C)

Molecular weight : 154.25 g/mol

Surface tension : 8.3 mN/m (20 °C)

SECTION 10. STABILITY AND REACTIVITY

Reactivity : No hazards to be specially mentioned.

Chemical stability : Stable under recommended storage conditions.

Possibility of hazardous reactions : Decomposes on heating in the presence of air.
Strongly exothermic reaction with air.Conditions to avoid : Exposure to air.
Heat.Incompatible materials : Bases
Strong acids
Strong oxidizing agents

Hazardous decomposition products : No decomposition if used as directed.

SECTION 11. TOXICOLOGICAL INFORMATIONAcute oral toxicity : LD50 (Rat): 2,790 mg/kg
: LD50 (Mouse): ca. 2,200 mg/kg

Acute inhalation toxicity : LCLo (lowest lethal concentration) (Mouse, 1 h): > 50 mg/l

Acute dermal toxicity : LD50 (Rabbit): 5,610 mg/kg

Skin irritation : Skin irritation (Rabbit, OECD Test Guideline 404)

Eye irritation : Eye irritation (Rabbit, OECD Test Guideline 405)

Sensitisation : Did not cause sensitization. (human, HRIPT: Human Repeat Insult Patch Test)

: Did not cause sensitisation on laboratory animals. (several

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	species, Various test systems)
Carcinogenicity	: No indication for carcinogenicity known.
Genotoxicity in vitro	: not mutagenic, not genotoxic (Various test systems)
Genotoxicity in vivo	: not genotoxic (Mouse, Bone marrow, Mutagenicity (micronucleus test))
Reproductive toxicity	: No indication for adverse effects on fertility known. NOAEL: 365 mg/kg bw/d (Rat)
Teratogenicity	: not teratogenic not embryotoxic NOAEL: 1,000 mg/kg bw/d (Rat, Oral)
STOT - single exposure (Acute exposure)	: The substance or mixture is not classified as specific target organ toxicant, single exposure.
STOT - repeated exposure	: NOAEL (Oral, Rat) : 117 mg/kg bw/d Subacute toxicity study (28 days) (OECD Test Guideline 407) : NOAEL (Dermal, Rat) : 250 mg/kg bw/d Sub-chronic toxicity study (90-day)
Experience with human exposure	: Overexposure may provoke the following symptoms: : Drowsiness, Disorders of the central nervous system, Respiratory disorders
Further information	: May cause irritation of respiratory tract.
Aspiration toxicity	: No aspiration toxicity classification

SECTION 12. ECOLOGICAL INFORMATION**Toxicity**

Toxicity to fish	: <i>Salmo gairdneri</i> (rainbow trout) LC50 (96 h) 27.8 mg/l (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	: <i>Daphnia magna</i> (Water flea) EC50 (48 h) 59 mg/l (OECD Test Guideline 202)
Toxicity to algae	: <i>Desmodesmus subspicatus</i> (green algae) ErC50 (96 h) 156.7 mg/l (nominal concentration)

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(DIN 38412)
: EbC50 (96 h) 88.3 mg/l
(nominal concentration)

Toxicity to bacteria : activated sludge
EC50 (3 h) > 100 mg/l
(OECD Test Guideline 209)

Persistence and degradability

Biodegradability : Readily biodegradable.
64.2 % (28 d)
(OECD Test Guideline 301D)

Bioaccumulative potential

Bioaccumulation : No bioaccumulation is to be expected (log Pow <= 4).

Partition coefficient: n-octanol/water : log Pow 2.9 (20 °C ; OECD Test Guideline 107)

Mobility in soil

Distribution among environmental compartments : Adsorption, Soil
Koc 75 (calculated value)

Surface tension : 8.3 mN/m (20 °C)

Results of PBT and vPvB assessment

Assessment : The substance does not fulfill the PBT criteria.
: The substance does not fulfill the vPvB criteria.

Other adverse effects

Regulation 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information : Harmful to aquatic organisms.

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : User must determine if any wastes generated exhibit hazardous characteristics as per 40 CFR Part 261 or other national / local legislation.

Discharge into the environment must be avoided.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Do not dispose of waste into sewer.
Offer surplus and non-recyclable solutions to a licensed dis-

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posal company.

Contaminated packaging : Dispose of as unused product.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION**International Regulation****UNRTDG**

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations**49 CFR**

UN/ID/NA number : NA 1993

Proper shipping name : Combustible liquid, n.o.s.
(linalool)

Class : CBL

Packing group : III

ERG Code : 128

Marine pollutant : no

Remarks : Above applies only to containers over 119 gallons or 450 liters. Not regulated if shipped in packages less than or equal to 119 gallons (450 liters).

SECTION 15. REGULATORY INFORMATION**TSCA list** : Not relevant

Not relevant

EPCRA - Emergency Planning and Community Right-to-Know Act**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard**SARA 302** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

linalool 78-70-6 90 - 100 %

New Jersey Right To Know

linalool 78-70-6 90 - 100 %

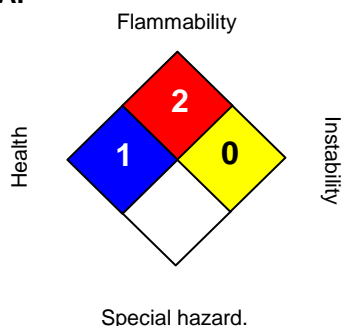
The components of this product are reported in the following inventories:

TSCA : On TSCA Inventory

SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS III:

HEALTH	2
FLAMMABILITY	2
PHYSICAL HAZARD	0

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

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 given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and

is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Abbreviations: ACGIH = American Conference of Governmental Industrial Hygienists. CERCLA = Comprehensive Environmental Response, Compensation and Liability Act. CFR = Code of Federal Regulations. CPR = Controlled Products Regulations. DSL = Canadian Domestic Substance List. DOT = Department of Transportation. EINECS = European Inventory of New and Existing Chemical Substances. EPA = Environmental Protection Agency. HCS = Hazardous Communication Standard. HEPA = High Efficiency Particulate Air. HMIS = Hazardous Material Identification System. IARC = International Agency for Research on Cancer. IATA = International Air Transport Association. IMDG = International Maritime Dangerous Good. NFPA = National Fire Protection Association. NIOSH = National Institute of Occupational Safety and Health. NJTSR = New Jersey Trade Secret Registry. NTP = National Toxicology Program. OSHA = Occupational Safety and Health Administration. SARA = Superfund Amendments and Reauthorization Act. TDG = Transportation of Dangerous Goods. TLV = Threshold Limit Value. TSCA = Toxic Substance Control Act. WHMIS = Workplace Hazardous Materials Information System.