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Safety Data Sheet **Organic Red Mandarin Essential Oil** *(Citrus reticulata)*

Safety Data Sheet dated 12/11/2025, version 1

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

1.1. Product identifier

Identification of the substance:

Trade name: Red mandarin oil

CAS number: 8008-31-9

EC number: 284-521-0

REACH number: 01-2120074120-72-XXXX

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

Recommended use:

Raw material for the manufacture of fragrances and/or flavourings.

Uses advised against:

None known

1.3. Details of the supplier of the safety data sheet

Company:

NHR Organic Oils Ltd. 24 Chatham Place Brighton BN1 3TN UK.

0044 01273 746505

Emergency telephone number 0044 01273 746505

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

EC regulation criteria 1272/2008 (CLP)



Warning, Flam. Liq. 3, Flammable liquid and vapour.



Aquatic Chronic 2, Toxic to aquatic life with long lasting effects.



Warning, Skin Irrit. 2, Causes skin irritation.



Warning, Skin Sens. 1B, May cause an allergic skin reaction.



Danger, Asp. Tox. 1, May be fatal if swallowed and enters airways.

Adverse physicochemical, human health and environmental effects:

No other hazards

2.2. Label elements

Hazard pictograms:



Danger

Hazard statements:

H226 Flammable liquid and vapour.

MANDR/1

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H411 Toxic to aquatic life with long lasting effects.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H304 May be fatal if swallowed and enters airways.

Precautionary statements:

P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/...
P331 Do NOT induce vomiting.
P391 Collect spillage.
P403+P235 Store in a well-ventilated place. Keep cool.

Special Provisions:

None

Contains

(R)-p-mentha-1,8-diene; d-limonene
gamma terpinene
ALFA PINENE

Special provisions according to Annex XVII of REACH and subsequent amendments:

None

2.3. Other hazards

No PBT, vPvB or endocrine disruptor substances present in concentration $\geq 0.1\%$

Other Hazards:

No other hazards

SECTION 3: Composition/information on ingredients

3.1. Substances

Identification of the substance:

Chemical characterization: Red mandarin oil

Trade code: MROB184 Product Batch N° MROB_25293

Product type and use: Industrial uses. Raw material for manufacture of fragrances and/or flavors

CAS number: 8008-31-9

EC number: 284-521-0

REACH number: 01-2120074120-72-XXXX

Qty	Name	Ident. Number	Classification
65% - 75%	(R)-p-mentha-1,8-diene; d-limonene	Index number: 601-096-00-2 CAS: 5989-27-5 EC: 227-813-5	 2.6/3 Flam. Liq. 3 H226  3.2/2 Skin Irrit. 2 H315  3.4.2/1B Skin Sens. 1B H317  3.10/1 Asp. Tox. 1 H304  4.1/A1 Aquatic Acute 1 H400 M=1. 4.1/C3 Aquatic Chronic 3 H412
15% - 20%	gamma terpinene	CAS: 99-85-4 EC: 202-794-6	 2.6/3 Flam. Liq. 3 H226  3.7/2 Repr. 2 H361  3.10/1 Asp. Tox. 1 H304

1% - 3%	ALFA PINENE	CAS: 7785-26-4 EC: 232-077-3	 2.6/3 Flam. Liq. 3 H226  3.1/4/Oral Acute Tox. 4 H302  3.10/1 Asp. Tox. 1 H304  3.2/2 Skin Irrit. 2 H315  3.4.2/1 Skin Sens. 1 H317  4.1/A1 Aquatic Acute 1 H400  4.1/C1 Aquatic Chronic 1 H410
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3.2. Mixtures
N.A.

SECTION 4: First aid measures

4.1. Description of first aid measures

In case of skin contact:

Immediately take off all contaminated clothing.

Areas of the body that have - or are only even suspected of having - come into contact with the product must be rinsed immediately with plenty of running water and possibly with soap. Wash thoroughly the body (shower or bath).

Remove contaminated clothing immediately and dispose off safely.

After contact with skin, wash immediately with soap and plenty of water.

In case of eyes contact:

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately.

Protect uninjured eye.

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

In case of Ingestion:

Do NOT induce vomiting.

In case of Inhalation:

Remove casualty to fresh air and keep warm and at rest.

4.2. Most important symptoms and effects, both acute and delayed

Irritating to skin or mucous membranes (inflammation). May produce an allergic reaction (rash, urticaria).

If ingested, it may cause temporary irritation to the gastrointestinal (digestive) tract.

4.3. Indication of any immediate medical attention and special treatment needed

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

Treatment:

None

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

In case of fire, use a foam fire extinguisher to extinguish.

CO2 or Dry chemical fire extinguisher.

Extinguishing media which must not be used for safety reasons:

None in particular.

5.2. Special hazards arising from the substance or mixture

Do not inhale explosion and combustion gases.

Burning produces heavy smoke.

5.3. Advice for firefighters

Keep containers cool with water spray.

SECTION 6: Accidental release measures

- 6.1. Personal precautions, protective equipment and emergency procedures
 - Wear personal protection equipment.
 - Remove all sources of ignition.
 - Remove persons to safety.
 - See protective measures under point 7 and 8.
- 6.2. Environmental precautions
 - Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.
- 6.3. Methods and material for containment and cleaning up
 - Wash with plenty of water.
- 6.4. Reference to other sections
 - See also section 8 and 13

SECTION 7: Handling and storage

- 7.1. Precautions for safe handling
 - Avoid contact with skin and eyes, inhalation of vapours and mists.
 - Advice on general occupational hygiene:
 - Do not eat, drink or smoke when using this product.
- 7.2. Conditions for safe storage, including any incompatibilities
 - Dry area, unopened containers, optimum temp. 11-18 °C
 - Always keep in a well ventilated place.
 - Store at below 20 °C. Keep away from unguarded flame and heat sources. Avoid direct exposure to sunlight.
 - Keep away from unguarded flame, sparks, and heat sources. Avoid direct exposure to sunlight.
 - Keep away from food, drink and feed.
 - Incompatible materials:
 - None in particular.
 - Instructions as regards storage premises:
 - Cool and adequately ventilated.
- 7.3. Specific end use(s)
 - None in particular

SECTION 8: Exposure controls/personal protection

- 8.1. Control parameters
 - No occupational exposure limit available
- DNEL Exposure Limit Values
 - Red mandarin oil - CAS: 8008-31-9
 - Worker Industry: 23.3 mg/m³ - Worker Professional: 23.3 mg/m³ - Consumer: 5.8 mg/m³ - Exposure: Human Inhalation - Frequency: Long Term, systemic effects
 - Worker Industry: 6.67 mg/kg bw/day - Worker Professional: 6.67 mg/kg bw/day - Consumer: 3.33 mg/kg bw/day - Exposure: Human Dermal - Frequency: Long Term (repeated)
 - Worker Industry: 185.8 µg/cm² - Worker Professional: 185.8 µg/cm² - Consumer: 92.9 µg/cm² - Exposure: Human Dermal - Frequency: Long Term, local effects
- PNEC Exposure Limit Values
 - Red mandarin oil - CAS: 8008-31-9
 - Target: Fresh Water - Value: 5.4 µg/l
 - Target: Marine water - Value: 0.54 µg/l
 - Target: Marine water sediments - Value: 0.13 mg/kg
 - Target: Soil (agricultural) - Value: 0.29 mg/kg
- 8.2. Exposure controls
 - Eye protection:

Eye glasses.
 Protection for skin:
 Full protection suit.
 Protection for hands:
 NBR (nitrile rubber).
 Respiratory protection:
 Not needed for normal use.
 Thermal Hazards:
 None
 Environmental exposure controls:
 None
 Appropriate engineering controls:
 None

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Method:	Notes
Physical state:	Liquid	--	--
Colour:	N.A.	--	--
Odour:	Fresh orange mandarin	--	--
Melting point/freezing point:	N.A.	--	--
Boiling point or initial boiling point and boiling range:	160 °C	OECD 103	--
Flammability:	Flam. Liq. 3, H226	--	--
Lower and upper explosion limit:	Not Relevant	--	--
Flash point:	51 ° C	EN ISO 3680	--
Auto-ignition temperature:	Not Relevant	--	--
Decomposition temperature:	Not Relevant	--	--
pH:	Not Relevant	--	--
Kinematic viscosity:	<= 14 mm ² /s (40 °C)	--	--
Solubility in water:	NO	--	--
Solubility in oil:	N.A.	--	--
Partition coefficient n-octanol/water (log value):	4.38	--	--
Vapour pressure:	280.7 Pa @ 25°C	ASTM D 323	--
Density and/or relative density:	0.84	OECD 109	--
Relative vapour density:	Not Relevant	--	--
Particle characteristics:			
Particle size:	N.A.	--	--

9.2. Other information

No other relevant information

SECTION 10: Stability and reactivity

- 10.1. Reactivity
None
- 10.2. Chemical stability
the product is stable
- 10.3. Possibility of hazardous reactions
It may catch fire on contact with oxidising mineral acids, and powerful oxidising agents.
- 10.4. Conditions to avoid
high temperatures, flames or other heat sources
- 10.5. Incompatible materials
No risk of reaction or danger in case of contact with other materials
- 10.6. Hazardous decomposition products
no risk of dangerous decomposition

SECTION 11: Toxicological information

- 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Toxicological information of the product:

Red mandarin oil - CAS: 8008-31-9

a) acute toxicity:

Test: LD50 - Route: Oral - Species: Rat > 5000 mg/kg - Duration: 14 days - Source:
Study report, 1974

Toxicological information of the main substances found in the product:

N.A.

If not differently specified, the information required in Regulation (EU)2020/878 listed below must be considered as N.A.:

- a) acute toxicity;
 - b) skin corrosion/irritation;
 - c) serious eye damage/irritation;
 - d) respiratory or skin sensitisation;
 - e) germ cell mutagenicity;
 - f) carcinogenicity;
 - g) reproductive toxicity;
 - h) STOT-single exposure;
 - i) STOT-repeated exposure;
 - j) aspiration hazard.
- 11.2. Information on other hazards
Endocrine disrupting properties:
No endocrine disruptor substances present in concentration $\geq 0.1\%$

SECTION 12: Ecological information

- 12.1. Toxicity

Adopt good working practices, so that the product is not released into the environment.

Red mandarin oil - CAS: 8008-31-9

a) Aquatic acute toxicity:

Endpoint: LL50 - Species: *Oncorhynchus mykiss* > 100 mg/l - Duration h: 96 - Notes:
OECD guideline 203

Endpoint: EL50 - Species: *Daphnia* = 8.9 mg/l - Duration h: 48 - Notes: OECD guideline
202

- 12.2. Persistence and degradability

Red mandarin oil - CAS: 8008-31-9

Biodegradability: Readily biodegradable

- 12.3. Bioaccumulative potential

Red mandarin oil - CAS: 8008-31-9

Not bioaccumulative

- 12.4. Mobility in soil
Red mandarin oil - CAS: 8008-31-9
Not mobile
- 12.5. Results of PBT and vPvB assessment
vPvB Substances: None - PBT Substances: None
- 12.6. Endocrine disrupting properties
No endocrine disruptor substances present in concentration $\geq 0.1\%$
- 12.7. Other adverse effects
None

SECTION 13: Disposal considerations

- 13.1. Waste treatment methods
Recover, if possible. Send to authorised disposal plants or for incineration under controlled conditions. In so doing, comply with the local and national regulations currently in force.
- Additional disposal information:

Dispose this product responsibly after use, in accordance with international standards, national and local laws.

SECTION 14: Transport information

- 14.1. UN number or ID number
ADR-UN number: 1197
IATA-UN Number: 1197
IMDG-UN Number: 1197
- 14.2. UN proper shipping name
ADR-Shipping Name: EXTRACTS, LIQUID
IATA-Shipping Name: EXTRACTS, LIQUID
IMDG-Shipping Name: EXTRACTS, LIQUID
- 14.3. Transport hazard class(es)
ADR-Class: 3
ADR-Label: flame
IATA-Class: 3
IATA-Label: flame
IMDG-Class: 3
- 14.4. Packing group
ADR-Packing Group: III
IATA-Packing group: III
IMDG-Packing group: III
- 14.5. Environmental hazards
Marine pollutant: Yes
Most important toxic component:
IMDG-EMS: F-E
- 14.6. Special precautions for user
ADR-Transport category (Tunnel restriction code): D/E
Rail (RID): 3
IATA-Passenger Aircraft: 355
IATA-Cargo Aircraft: 366
IMDG-Shipping Name: EXTRACTS, LIQUID
- 14.7. Maritime transport in bulk according to IMO instruments
N.A.

SECTION 15: Regulatory information

- 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Dir. 98/24/EC (Risks related to chemical agents at work)

Dir. 2000/39/EC (Occupational exposure limit values)
Regulation (EC) n. 1907/2006 (REACH)
Regulation (EC) n. 1272/2008 (CLP)
Regulation (EC) n. 790/2009 (ATP 1 CLP) and (EU) n. 758/2013
Regulation (EU) n. 2020/878
Regulation (EU) n. 286/2011 (ATP 2 CLP)
Regulation (EU) n. 618/2012 (ATP 3 CLP)
Regulation (EU) n. 487/2013 (ATP 4 CLP)
Regulation (EU) n. 944/2013 (ATP 5 CLP)
Regulation (EU) n. 605/2014 (ATP 6 CLP)
Regulation (EU) n. 2015/1221 (ATP 7 CLP)
Regulation (EU) n. 2016/918 (ATP 8 CLP)
Regulation (EU) n. 2016/1179 (ATP 9 CLP)
Regulation (EU) n. 2017/776 (ATP 10 CLP)
Regulation (EU) n. 2018/669 (ATP 11 CLP)
Regulation (EU) n. 2018/1480 (ATP 13 CLP)
Regulation (EU) n. 2019/521 (ATP 12 CLP)
Regulation (EU) n. 2020/217 (ATP 14 CLP)
Regulation (EU) n. 2020/1182 (ATP 15 CLP)
Regulation (EU) n. 2021/643 (ATP 16 CLP)
Regulation (EU) n. 2021/849 (ATP 17 CLP)
Regulation (EU) n. 2022/692 (ATP 18 CLP)
Regulation (EU) n. 2023/707
Regulation (EU) n. 2023/1434 (ATP 19 CLP)
Regulation (EU) n. 2023/1435 (ATP 20 CLP)
Regulation (EU) n. 2024/197 (ATP 21 CLP)

Restrictions related to the product or the substances contained according to Annex XVII Regulation (EC) 1907/2006 (REACH) and subsequent modifications:

Restrictions related to the product:

Restriction 3

Restriction 40

Restrictions related to the substances contained:

Restriction 75

Volatile Organic compounds - VOCs = 630.00 g/l

Volatile CMR substances = 0.00 %

Halogenated VOCs which are assigned the risk phrase R40 = 0.00 %

Organic Carbon - C = 0.00

Where applicable, refer to the following regulatory provisions :

Directive 2012/18/EU (Seveso III)

Regulation (EC) nr 648/2004 (detergents).

Dir. 2004/42/EC (VOC directive)

Provisions related to directive EU 2012/18 (Seveso III):

Seveso III category according to Annex 1, part 1

Product belongs to category: P5c, E1

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out for the mixture.

SECTION 16: Other information

Full text of phrases referred to in Section 3:

H226 Flammable liquid and vapour.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H304 May be fatal if swallowed and enters airways.
H400 Very toxic to aquatic life.
H412 Harmful to aquatic life with long lasting effects.
H361 Suspected of damaging fertility or the unborn child.
H302 Harmful if swallowed.
H410 Very toxic to aquatic life with long lasting effects.

Hazard class and hazard category	Code	Description
Flam. Liq. 3	2.6/3	Flammable liquid, Category 3
Acute Tox. 4	3.1/4/Oral	Acute toxicity (oral), Category 4
Asp. Tox. 1	3.10/1	Aspiration hazard, Category 1
Skin Irrit. 2	3.2/2	Skin irritation, Category 2
Skin Sens. 1	3.4.2/1	Skin Sensitisation, Category 1
Skin Sens. 1B	3.4.2/1B	Skin Sensitisation, Category 1B
Repr. 2	3.7/2	Reproductive toxicity, Category 2
Aquatic Acute 1	4.1/A1	Acute aquatic hazard, category 1
Aquatic Chronic 1	4.1/C1	Chronic (long term) aquatic hazard, category 1
Aquatic Chronic 2	4.1/C2	Chronic (long term) aquatic hazard, category 2
Aquatic Chronic 3	4.1/C3	Chronic (long term) aquatic hazard, category 3

This safety data sheet has been completely updated in compliance to Regulation 2020/878.
Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Classification according to Regulation (EC) Nr. 1272/2008	Classification procedure
Flam. Liq. 3, H226	On basis of test data
Aquatic Chronic 2, H411	Calculation method
Skin Irrit. 2, H315	Calculation method
Skin Sens. 1B, H317	Calculation method
Asp. Tox. 1, H304	Calculation method

This document was prepared by a competent person who has received appropriate training.
Main bibliographic sources:

ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre,
Commission of the European Communities
SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van
Nostrand Reinold

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

This MSDS cancels and replaces any preceding release.

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
ATE: Acute Toxicity Estimate
ATEmix: Acute toxicity Estimate (Mixtures)
CAS: Chemical Abstracts Service (division of the American Chemical Society).
CLP: Classification, Labeling, Packaging.
DNEL: Derived No Effect Level.

EINECS:	European Inventory of Existing Commercial Chemical Substances.
GefStoffVO:	Ordinance on Hazardous Substances, Germany.
GHS:	Globally Harmonized System of Classification and Labeling of Chemicals.
IATA:	International Air Transport Association.
IATA-DGR:	Dangerous Goods Regulation by the "International Air Transport Association" (IATA).
ICAO:	International Civil Aviation Organization.
ICAO-TI:	Technical Instructions by the "International Civil Aviation Organization" (ICAO).
IMDG:	International Maritime Code for Dangerous Goods.
INCI:	International Nomenclature of Cosmetic Ingredients.
KSt:	Explosion coefficient.
LC50:	Lethal concentration, for 50 percent of test population.
LD50:	Lethal dose, for 50 percent of test population.
PNEC:	Predicted No Effect Concentration.
RID:	Regulation Concerning the International Transport of Dangerous Goods by Rail.
STEL:	Short Term Exposure limit.
STOT:	Specific Target Organ Toxicity.
TLV:	Threshold Limiting Value.
TWA:	Time-weighted average
WGK:	German Water Hazard Class