

SAFETY DATA SHEET



n-Nonanal
10540

Version / Revision
Supersedes Version

4.01
4.00***

Revision Date
Issuing date

30-Nov-2020
30-Nov-2020

SECTION 1: Identification

1.1. Product identifier

Identification of the
substance/preparation

n-Nonanal

CAS-No

124-19-6

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

Use of the Substance /
Preparation

Intermediate

Uses advised against

None

1.3. Details of the supplier of the safety data sheet

Supplier

OQ Chemicals Corporation
15375 Memorial Drive
West Memorial Place I
Suite 300
Houston, TX 77079
USA
Phone +1 346 378 7300

Product Information

Product Stewardship
FAX: +49 (0)208 693 2053
email: sc.psq@oq.com

1.4. Emergency telephone number

Emergency telephone number

NCEC +1 202 464 2554
available 24/7

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

This substance is classified in accordance with paragraph (d) of §1910.1200 (GHS-US classification).

Flammable liquid Category 4, H227

Environmental hazard Aquatic Acute 2; H401; Aquatic Chronic 3; H412

OSHA Specified Hazards

Not applicable.

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2.2. Label elements

Labeling according to §1910.1200 (GHS-US labeling).

Signal word

Warning

Hazard statements

H227: Combustible liquid
H401: Toxic to aquatic life
H412: Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention

P210: Keep away from flames and hot surfaces. - No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/eye protection/face protection.

Storage

P403 + P235: Store in a well ventilated place. Keep cool.

Disposal

P501: Dispose of contents/container in accordance with local regulation.

2.3. Other hazards

Vapour/air-mixtures are explosive at intense warming

SECTION 3: Composition / information on ingredients

3.1. Substances

Component	CAS-No	Concentration (%)
Nonanal	124-19-6	> 88,0

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation

Keep at rest. Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

Skin

Wash off immediately with soap and plenty of water. When symptoms persist or in all cases of doubt seek medical advice.

Eyes

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Obtain medical attention.

Ingestion

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Do not induce vomiting without medical advice. Call a physician immediately.

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

Main symptoms

nausea, shortness of breath, dizziness.

Special hazard

Lung oedema, Lung irritation.

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

General advice

Remove contaminated, soaked clothing immediately and dispose of safely. First aider needs to protect himself.

Treat symptomatically. In case of lung irritation, first treatment with cortisone spray.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

alcohol-resistant foam, dry chemical, carbon dioxide (CO₂), water spray

Unsuitable Extinguishing Media

Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Under conditions giving incomplete combustion, hazardous gases produced may consist of:

carbon monoxide (CO)

carbon dioxide (CO₂)

Combustion gases of organic materials must in principle be graded as inhalation poisons

Vapours are heavier than air and may spread along floors

Vapour/air-mixtures are explosive at intense warming

5.3. Advice for firefighters

Special protective equipment for firefighters

Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full fire-fighting turn out gear.

Precautions for firefighting

Keep people away from and upwind of fire. Cool containers / tanks with water spray. Dike and collect water used to fight fire. Water run-off can cause environmental damage.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

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For non-emergency personnel: For personal protective equipment see section 8. Avoid contact with skin and eyes. Avoid breathing vapors or mists. Keep people away from and upwind of spill/leak. Ensure adequate ventilation, especially in confined areas. Keep away from heat and sources of ignition.
For emergency responders: Personal protection see section 8.

6.2. Environmental precautions

Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant). Water runoff can cause environmental damage.

6.3. Methods and material for containment and cleaning up

Methods for containment

Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.

Methods for cleaning up

Soak up with inert absorbent material. DO NOT use combustible materials such as sawdust. Keep in suitable, closed containers for disposal. If liquid has been spilt in large quantities clean up promptly by scoop or vacuum. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

6.4. Reference to other sections

For personal protective equipment see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in work rooms. Refill and handle product only in closed system.

Hygiene measures

When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Advice on the protection of the environment

See Section 8: Environmental exposure controls.

Incompatible products

acids and bases
amines
oxidizing agents

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion

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Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material. Vapour/air-mixtures are explosive at intense warming.

Technical measures/Storage conditions

Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care. Handle under nitrogen, protect from moisture. Keep at temperatures between 0 and 49 °C (32 and 120 °F).

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits United States of America

No exposure limits established regarding ACGIH, OSHA Z-1 and OSHA Z-2.

8.2. Exposure controls

Appropriate Engineering controls

General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Individual protection measures, such as personal protective equipment

General industrial hygiene practice

Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures

When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Eye protection

Tightly fitting safety goggles. In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.

Hand protection

Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

Suitable material	nitrile rubber
Evaluation	according to EN 374: level 4
Glove thickness	approx 0,55 mm
Break through time	approx 90 min

Suitable material	butyl-rubber
Evaluation	according to EN 374: level 3

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Glove thickness approx 0,3 mm
Break through time approx 50 min

Skin and body protection

Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.

Respiratory protection

Respirator with filter for organic vapour. Use the indicated respiratory protection if the occupational exposure limit is exceeded and/or in case of product release (vapor or mist). Equipment should conform to NIOSH.***

Environmental exposure controls

If possible use in closed systems. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. Observe the exposure limits, clean exhaust air if needed. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance liquid @ 20 °C (68 °F)
Colour colourless
Odour fruity
Odour threshold No data available
pH No data available
Melting point/range -2,2 °F (-19 °C) (Pour point)
Method DIN ISO 3016
Boiling point/range 361,4 °F (183 °C) @ 1 atm (101,3 kPa)
Method OECD 103
Flash point 167 °F (75 °C) @ 1013 hPa
Method ISO 2719
Evaporation rate No data available
Flammability (solid, gas) Does not apply, the substance is a liquid
Lower explosion limit 0,59 Vol %
Upper explosion limit 6,54 Vol %

Vapour pressure

Values [hPa]	Values [kPa]	Values [atm]	@ °C	@ °F	Method
2	0,2	< 0,001	20	68	DIN EN 13016-2
8,1	0,81	0,008	50	122	DIN EN 13016-2

Vapour density 4,9 (Air = 1) @ 20 °C (68 °F)

Relative density

Values	@ °C	@ °F	Method
0,8230	20	68	DIN 51757

Solubility 101 mg/l @ 68 °F (20 °C), in water, OECD 105

log Pow OECD 117 4,1 @ 25 °C (77 °F)***

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Autoignition temperature	383 °F (195 °C)
Method	DIN 51794
Decomposition temperature	No data available
Viscosity	1,40 mPa*s @ 68 °F (20 °C)
Method	ASTM D445, dynamic

9.2. Other information

Molecular weight	142,24
Molecular formula	C ₉ H ₁₈ O
log Koc	2.84 @ 35 °C OECD 121
Dissociation constant	No data available
Oxidizing properties	Does not apply, substance is not oxidising. There are no chemical groups associated with oxidizing properties
Refractive Index	1,424 @ 68 °F (20 °C)
Explosive properties	Does not apply, substance is not explosive. There are no chemical groups associated with explosive properties
Surface tension	48.1 mN/m (89.26 mg/l @ 20°C), OECD 115

SECTION 10: Stability and Reactivity

10.1. Reactivity

The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any text book on organic chemistry.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

When finely distributed, self-ignition is possible. May form explosive peroxides. Hazardous polymerisation may occur. Polymerization is a highly exothermic reaction and may generate sufficient heat to cause thermal decomposition and/or rupture containers.

10.4. Conditions to avoid

Avoid contact with heat, sparks, open flame and static discharge. Avoid any source of ignition.

10.5. Incompatible materials

bases, amines, acids, oxidizing agents.

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.

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SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure Ingestion, Inhalation, Eye contact, Skin contact

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Main symptoms

nausea, shortness of breath, dizziness.

Target Organ Systemic Toxicant - Single exposure

Due to lack of data, a classification is not possible for:

STOT SE

Target Organ Systemic Toxicant - Repeated exposure

Based on available data, the classification criteria are not met for:

STOT RE

Acute toxicity				
Nonanal (124-19-6)				
Routes of Exposure	Endpoint	Values	Species	Method
Oral	LD50	5000 mg/kg	rat, male/female***	Weight of evidence***
Inhalative	LC0	0,95 mg/l	rat	
Dermal	LD50	5000 mg/kg	rabbit	Weight of evidence***

Nonanal, CAS: 124-19-6

Assessment

Based on available data, the classification criteria are not met for:

Acute oral toxicity

Acute dermal toxicity

Acute inhalation toxicity

Irritation and corrosion				
Nonanal (124-19-6)				
Target Organ Effects	Species	Result	Method	
Eyes	rabbit	No eye irritation	EPA OPP 81-4	in vivo***
Skin	rabbit	irritating	EC Directive L251	4h in vivo***

Nonanal, CAS: 124-19-6

Assessment

Based on available data, the classification criteria are not met for:

skin irritation/corrosion

eye irritation/corrosion

Sensitization				
Nonanal (124-19-6)				
Target Organ Effects	Species	Evaluation	Method	
Skin	Human experience	not sensitizing	Human repeat insult	5 %, in Ethanol read

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			patch test (HRIPT) read across	across***
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Assessment

Based on available data, the classification criteria are not met for:

Skin sensitization

For respiratory sensitization, no data are available

Subacute, subchronic and prolonged toxicity

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Type	Dose	Species	Method	
Subacute toxicity	LOAEL: 500 mg/kg/d (2 weeks)	rabbit	Dermal	
Subchronic toxicity 90-day	NOAEL: 20000 ppm	rat	OECD 408 Oral read across	

Nonanal, CAS: 124-19-6

Assessment

Based on available data, the classification criteria are not met for:

STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity

Nonanal (124-19-6)

Type	Dose	Species	Evaluation	Method	
Mutagenicity		rat, hepatocytes human hepatocytes	negative	UDS test	In vitro study
Mutagenicity		Salmonella typhimurium	negative	OECD 471 (Ames)	In vitro study
Mutagenicity		rat, hepatocytes	positive	SCE	In vitro study
Mutagenicity		rat, hepatocytes	negative	Chromosomal Aberration	In vitro study
Mutagenicity		mouse lymphoma cells	negative	Mouse lymphoma assay	In vitro study
Mutagenicity		mouse	negative	OECD 474	in vivo read across
Reproductive toxicity	LOAEL 1500 mg/kg/d	rat, parental, female***		Weight of evidence	Oral read across***
Reproductive toxicity	NOAEL 200 mg/kg/d	Rat, prenatal, female***		Weight of evidence	Oral read across***
Developmental Toxicity	No data available				
Reproductive toxicity***	NOEL 200 mg/kg/d***	rat, 1. Generation, male/female***		Weight of evidence***	Oral read across***

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CMR Classification

The available data on CMR properties are summarized in the table above. They do not indicate a classification into

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categories 1A or 1B

Evaluation

In vitro tests did not show mutagenic effects
In the absence of specific alerts no cancer testing is required

Note

Handle in accordance with good industrial hygiene and safety practice. Further details on substance data can be found in the registration dossier under the following link:
<http://echa.europa.eu/information-on-chemicals/registered-substances>.

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity			
Nonanal (124-19-6)			
Species	Exposure time	Dose	Method
Daphnia magna (Water flea)	48h	EC50: 1,54 mg/l	OECD 202
Pseudokirchneriella subcapitata***	72h	EC50: 4,50 mg/l (Growth rate)	OECD 201
Pseudokirchneriella subcapitata***	72h	EC50: 1,79 mg/l (Biomass)	OECD 201
Oncorhynchus mykiss (rainbow trout)	96h	EC50: 2,1 mg/l	OECD 203
Activated sludge (domestic)	3 h	EC50: ca 70 mg/l***	OECD 209

Long term toxicity				
Nonanal (124-19-6)				
Type	Species	Dose	Method	
Aquatic toxicity	Pseudokirchneriella subcapitata***	NOEC: 0,759 mg/l (3d)	OECD 201	

12.2. Persistence and degradability

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Biodegradation

83 % (28 d), inoculum, activated sludge (domestic), aerobic, OECD 301 F.***

Abiotic Degradation		
Nonanal (124-19-6)		
Type	Result	Method
Hydrolysis	No data available	
Photolysis	No data available	

12.3. Bioaccumulative potential

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Type	Result	Method
log Pow	4,1 @ 25 °C***	measured, OECD 117
BCF	94 l/kg	calculated

12.4. Mobility in soil

Nonanal (124-19-6)		
Type	Result	Method
Surface tension	48,1 mN/m @ 20 °C (68 °F) @ 89,26 mg/l	OECD 115
Adsorption/Desorption	log Koc: 2,84 @ 35 °C	OECD 121
Distribution to environmental compartments	no data available	

12.5. Results of PBT and vPvB assessment

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PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

12.6. Other adverse effects

Nonanal, CAS: 124-19-6

No data available

Note

Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product Information

Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.

Uncleaned empty packaging

Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

SECTION 14: Transport information

Section 14.1 - 14.6

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D.O.T. (49CFR)

14.1. UN number	NA 1993
14.2. UN proper shipping name	Combustible liquid, n.o.s. (n-Nonanal)
14.3. Transport hazard class(es)	3
14.4. Packing group	III
14.5. Environmental hazards	no
14.6. Special precautions for user	
Emergency Response Guide	128
Remarks	Only regulated if over 119 gallons

ICAO-TI / IATA-DGR

Not restricted

IMDG

Not restricted

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code not applicable

SECTION 15: Regulatory information

Federal and State Regulations

Components of the product are listed in the quoted regulations. For details please refer to the regulations directly. This list is not exhaustive, please check for other applicable regulations.

Federal Regulations

This product is listed on the TSCA inventory

International Inventories

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AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2046885 (EU)
ENCS (2)-494 (JP)
ISHL (2)-494 (JP)
KECI KE-26088 (KR)
PICCS (PH)
TSCA (US)

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NZIoC (NZ)
TCSI (TW)

SECTION 16: Other information

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Hazard Rating Systems

NFPA (National Fire Protection Association)

Health Hazard	1
Fire Hazard	2
Reactivity	1

HMS (Hazardous Material Information System)

Health Hazard	1
Flammability	2
Physical Hazard	1

Training advice

For effective first-aid, special training / education is needed.

Sources of key data used to compile the datasheet

Information contained in this safety data sheet is based on OQ owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet

Changes against the previous version are marked by ***. Observe national and local legal requirements. For more information, other material safety data sheets or technical data sheets please consult the OQ homepage (www.chemicals.oq.com).

The use of a comma in section 3 and section 7 to 12 is the same as a period.

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End of Safety Data Sheet