

SAFETY DATA SHEET


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HEXANE

SDS No. M0118

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Hexane

Synonyms: n-Hexane, Hexanes

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. HAZARDS IDENTIFICATION



Classification:

Flammable Liquids: GHS Category 2

Skin Irritation: GHS Category 2

Eye Irritation: GHS Category 2B

Reproductive Toxicity: GHS Category 2

Specific Target Organ Exposure, single exposure: GHS Category 3

Specific Target Organ Exposure, multiple exposure: GHS Category 2

Aspiration Hazard: GHS Category 1

Acute Aquatic Hazard: GHS Category 2

Label Elements

Signal Word: DANGER!

Hazard Statements:

- H225 – Highly flammable liquid and vapor.
- H304 – May be fatal if swallowed and enters airways.
- H315 – Causes skin irritation.
- H320 – Causes eye irritation.
- H332 – Harmful if inhaled.
- H336 – May cause drowsiness or dizziness.
- H361 – Suspected of damaging fertility or the unborn child.

Precautionary Statements:

- P210 – Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P243 – Take precautionary measures against static discharge.

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

P301+P310 – IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.

P303+P361+P353 – IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.

P304+P340 – IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

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

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

P501 – Dispose of contents/ container to an approved waste disposal plant.

Emergency Overview

Harmful if inhaled, swallowed or absorbed through the skin. Causes irritation to skin, eyes, and respiratory tract. Affects the central and peripheral nervous system. Aspiration hazard. Possible risk for impaired fertility. Highly flammable liquid and vapor. May cause flash fire. Static electrical hazard. Target Organs: Central nervous system, respiratory system, eyes, skin, peripheral nervous system, and testes.

HMIS Rating:

Health – 1* Flammability – 3 Physical Hazard – 0 PPE – User supplied

NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
n-Hexane	110-54-3	60%-100%	Yes

4. FIRST-AID MEASURES

Inhalation: If inhaled, remove to fresh air. If breathing is labored or with coughing, give 100% supplemental oxygen. If not breathing, begin artificial respiration. Get medical aid.

Ingestion: Aspiration hazard. Get medical aid. Do not induce vomiting unless directed by medical personnel. Never give anything by mouth to an unconscious person. If not breathing, begin artificial respiration. DO NOT give mouth-to-mouth resuscitation.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover irritated skin with an emollient or anti-bacterial cream. Soap and cold water may be used. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact: Check for and remove contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Notes to Physician: Treat symptomatically and supportively. For ingestion, the stomach should be intubated, aspirated, and lavaged with a slurry of activated charcoal – protect the airway from aspiration of gastric contents. Analgesics may be necessary for pain management, there is no specific antidote. Monitor arterial blood gases in cases of severe aspiration.

5. FIRE FIGHTING MEASURES

Flammability: Highly flammable liquid and vapor (GHS Category 2)

Auto-ignition Temperature: 225° C (437° F)

Flash Point: -22° C (-7.6° F)

Flammable Limits: Lower Limit – 1.0 vol %, Upper Limit – 8.1 vol %

Products of Combustion: Will decompose into highly toxic and irritating gases (carbon monoxide and carbon dioxide) under fire conditions.

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. May accumulate static electric charge and may cause ignition of its own

vapors. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. Hexane floats on water and may travel to a source of ignition and spread fire.

Specific Explosion Hazards: None

Fire Fighting Media: Use dry chemical, carbon dioxide, or appropriate foam. Solid streams of water may be ineffective and spread material. Water will not cool hexane below its flash point.

National Fire Protective Association: Health - 0, Flammability - 3, Reactivity - 0

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. ACCIDENTAL RELEASE MEASURES

Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Provide ventilation to the affected area and remove all ignition sources. Avoid run-off into storm sewers and ditches that lead to waterways. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Use only non-sparking tools and equipment. A vapor suppressing foam may be used. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Ground and bond containers when transferring material. Avoid accumulation of static electricity. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Empty containers contain product residue (liquid and vapor) and can be dangerous. Keep container tightly closed and away from heat, spark, and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Use with adequate ventilation. Avoid breathing vapor or mist.

Storage: Keep in a flammables area away from all sources of ignition and oxidizing materials. Keep in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Protect from moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection: Wear protective chemical goggles or appropriate eye protection. Use appropriate protective gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Exposure Limits:

ACGIH – 50 ppm TWA; Skin – potential significant contribution to overall exposure by cutaneous route

NIOSH – 50 ppm TWA; 180 mg/m³ TWA; 1100 ppm IDLH

OSHA Final PELs – 500 ppm TWA; 1800 mg/m³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: gasoline-like odor

Odor Threshold: 130 ppm

Molecular Formula: CH₃(CH₂)₄CH₃

Molecular Weight: 86.18

Auto-ignition Temperature: 225° C (437° F)

Flash Point: -22° C (-7.6° F)

Flammable Limits: Lower Limit – 1.1 vol %, Upper Limit – 7.5 vol %

pH: Not available.

Boiling Point: 69° C @ 760 mm Hg

Freezing/Melting Point: -95° C

Decomposition Temperature: Not available

Specific Gravity: 0.659 g/cm³ @ 20° C

Vapor Density (Air=1): 2.97

Vapor Pressure: 124 mm Hg @ 20° C.

Viscosity: 0.31 cP 20° C

Solubility: Insoluble

Conductivity: Nonconductive; Conductivity = 3×10^{-5} pS/m; Dielectric Constant = 1.9; Relaxation Time Constant = ~100 seconds (dissipation)

10. STABILITY AND REACTIVITY

Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Ignition sources, excess heat, electrical sparks, confined spaces, and vapor accumulation.

Incompatibility With Various Substances: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Acute Exposure Hazards:

INHALATION HAZARD: Inhalation of vapors irritates the respiratory tract. Overexposure may cause central nervous system depression with lightheadedness, nausea, headache, and blurred vision. Greater exposure may cause muscle weakness, numbness of the extremities, unconsciousness and suffocation. Vapors can displace oxygen, especially in confined spaces.

INGESTION HAZARD: May produce gastrointestinal irritation with abdominal pain, nausea, vomiting, and diarrhea. Aspiration into lungs may cause chemical pneumonitis, which may be fatal. May cause central nervous system depression.

SKIN CONTACT HAZARD: May cause redness, irritation, dryness, cracking, and pain. Defatting or dermatitis may result from prolonged or repeated exposure. Hexane may be absorbed through the skin with possible systemic effects. There are no reports of skin sensitization through occupational exposure. Sensitization was not observed in a maximization test using 25 volunteers.

EYE CONTACT HAZARD: Vapors cause mild irritation. Splashes may cause redness and pain.

Chronic Exposure Hazards: Repeated or prolonged skin contact may defat the skin and produce irritation and dermatitis. Prolonged exposure may cause adverse reproductive effects and visual disturbances. Chronic inhalation may cause peripheral nerve disorders and central nervous system effects. Laboratory tests have resulted in mutagenic effects. May affect the developing fetus. Chronic exposure produces peripheral neuropathy with effects including muscular weakness, paresthesia, numbing of the hands, feet, legs, and arms, unsteadiness, and difficulty walking and standing. Repeated exposure may cause nervous system abnormalities with muscle weakness and damage, motor incoordination, and sensation disturbances. Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

Animal Toxicity:

Draize test, rabbit, eye: 10 mg Mild;

Inhalation, mouse: LC50 = 150,000 mg/m³/2H;

Inhalation, rat: LC50 = 4800 ppm/4H;

Inhalation, rat: LC50 = 627,000 mg/m³/3M;

Oral, rat: LD50 = 25 g/kg;

Carcinogenicity: Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65

Epidemiology: Occupational polyneuropathy has resulted from hexane exposures as low as 500 ppm, but minimum levels of n-hexane that are neurotoxic in humans haven't been established. Nearly continuous exposure of animals in 250 ppm has caused neurotoxic effects.

Teratogenicity: No evidence of teratogenicity or embryotoxicity in animal studies with hexane. Fetotoxicity has been observed in the presence of maternal toxicity.

Reproductive Effects: Severe testicular damage has been observed in rats exposed to hexane at concentrations which have produced other significant toxicity. Although subneurotoxic doses of its principle metabolite, 2,5-hexanedione, can induce progressive testicular toxicity in rats, there have been no reports of human sterility or other reproductive toxicity associated with n-hexane exposure.

Mutagenicity: Positive results (chromosomal damage in the bone marrow cells) obtained for rats exposed by inhalation to n-hexane.

Neurotoxicity: n-Hexane is a mild irritant and central nervous system depressant in acute exposure, but its principle effect are damage to sensory and motor peripheral nerves, particularly in chronic exposure. .

12. ECOLOGICAL INFORMATION

Ecotoxicity: Experimental studies involving Hexane show acute aquatic toxicity values of 2.1 mg/L and greater than 1000 mg/L.

Environmental Fate: Persistence: Volatilization from soil surfaces is expected to be an important fate process. Hexane will be degraded in the atmosphere by reaction with hydroxyl radicals; the half-life of this reaction in air is estimated to be three days. Screening studies suggest that Hexane will undergo biodegradation in soil and water surfaces, but volatilization is expected to be the predominant fate process in the environment. Hydrolysis is not expected to be an important environmental fate process. Bioaccumulation: An estimated bioconcentration factor (BCF) of 2300 and log Kow of 3.9 for Hexane suggest the potential for bioconcentration in aquatic organisms is high. Metabolites may partially bioaccumulate in the lipid bilayer of fish tissues. Mobility: Hexane is highly volatile and will partition rapidly in the air. When released into water, Hexane will be lost by volatilization and biodegradation. Hexane is expected to have high mobility in soils/sediments based on a Koc of 150. Volatilization from moist soil surfaces is expected to be an important fate process based on a Henry's law constant of 1.83 atm-m³/mole. Hexane may volatilize from dry surfaces based on its vapor pressure.

13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, usage or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

US DOT

Proper Shipping Name: Hexanes
Hazard Class: 3
UN Number: UN1208
Packing Group: II

IMDG

Proper Shipping Name: Hexanes
Hazard Class: 3
UN Number: UN1208
Packing Group: II

IATA

Proper Shipping Name: Hexanes
Hazard Class: 3

UN Number: UN1208

Packing Group: II

15. REGULATORY INFORMATION

US Federal Regulations:

CERCLA Hazardous Substances: CAS# 110-54-3 – 5000 lb final RQ; 2270 kg final RQ

SARA Section 302: Does not have a TPQ

SARA Codes: CAS# 110-54-3 – immediate, delayed, fire

Section 313: n-Hexane (CAS# 110-54-3) is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.

Clean Air Act: CAS# 110-54-3 is listed as a hazardous air pollutant (HAP).

OSHA: Not considered highly hazardous by OSHA.

US State Regulations:

CAS# 110-54-3 is on the following state right-to-know lists: New Jersey, Pennsylvania, and Massachusetts

California Prop 65: This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Originally Prepared: 10/24/2006

Last Revised: 7/23/2020 – Precautionary statements added to section 2.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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