SIGMA-ALDRICH

MATERIAL SAFETY DATA SHEET

Date Printed: 05/24/2004
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Version 1.6

Section 1 - Product and Company Information

Product Name                      HEXANE, 95+%, HPLC GRADE (POLY-COATEDBOTTLE)
Product Number                    439177
Brand                              ALDRICH
Company                            Sigma-Aldrich
Street Address                     3050 Spruce Street
City, State, Zip, Country          SAINT LOUIS MO 63103 US
Technical Phone:                   314 771 5765
Emergency Phone:                   414 273 3850 Ext. 5996
Fax:                               800 325 5052

Section 2 - Composition/Information on Ingredient

Substance Name                      CAS #             SARA 313
N-HEXANE                            110-54-3          Yes

Formula        C6H14
Synonyms        Esani (Italian) * Gettysolve-B * Heksan (Polish)
                * n-Hexane (ACGIH:OSHA) * Hexanen (Dutch) * Hexyl
                hydride * NCI-C60571
RTECS Number:  MN9275000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW
Flammable (USA) Highly Flammable (EU). Harmful. Dangerous for the environment.
Highly flammable. Irritating to skin. Harmful: danger of serious damage to health by prolonged exposure through inhalation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Possible risk of impaired fertility. Harmful: may cause lung damage if swallowed. Vapors may cause drowsiness and dizziness.
Target organ(s): Nerves. Kidneys.

HMIS RATING
HEALTH: 2*
FLAMMABILITY: 3
REACTIVITY: 0

NFPA RATING
HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures
ORAL EXPOSURE
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE
In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE
In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS
Flammable Hazards: Yes

EXPLOSION HAZARDS
Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

FLASH POINT
-14.8 °F   -26 °C   Method: closed cup

EXPLOSION LIMITS
Lower: 1.2 %   Upper: 7.7 %

AUTOIGNITION TEMP
234 °C

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions. Vapor may travel considerable distance to source of ignition and flash back. Specific Method(s) of Fire Fighting: Use water spray to cool fire-exposed containers.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Section 7 - Handling and Storage

HANDLING
User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep tightly closed. Keep away from heat, sparks, and open flame. Store in a cool dry place.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Government approved respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Remove and wash contaminated clothing promptly. Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>ACGIH</td>
<td>TWA</td>
<td>50 PPM</td>
</tr>
<tr>
<td>Remarks: Skin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>MSHA Standard-air</td>
<td>TWA</td>
<td>500 PPM (1800 MG/M3)</td>
</tr>
<tr>
<td>USA</td>
<td>OSHA.</td>
<td>PEL</td>
<td>8H TWA 500 PPM (1800 MG/M3)</td>
</tr>
<tr>
<td>New Zealand OEL</td>
<td>Remarks: check ACGIH TLV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>NIOSH</td>
<td>TWA</td>
<td>50 PPM</td>
</tr>
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</table>

EXPOSURE LIMITS

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>NDS</td>
<td></td>
<td>100 MG/M3</td>
</tr>
<tr>
<td>Poland</td>
<td>NDSCh</td>
<td></td>
<td>400 MG/M3</td>
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<tr>
<td>Poland</td>
<td>NDSP</td>
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<td>-</td>
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</tbody>
</table>

Section 9 - Physical/Chemical Properties

Appearance: Physical State: Liquid

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular Weight</td>
<td>86.18 AMU</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>BP/BP Range</td>
<td>68 - 70 °C</td>
<td></td>
</tr>
<tr>
<td>MP/MP Range</td>
<td>-95 °C</td>
<td></td>
</tr>
<tr>
<td>Freezing Point</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>132 mmHg</td>
<td>20 °C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>3 g/l</td>
<td></td>
</tr>
<tr>
<td>Saturated Vapor Conc.</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>SG/Density</td>
<td>0.659 g/cm3</td>
<td></td>
</tr>
<tr>
<td>Bulk Density</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>
Odor Threshold          64 - 244 ppm
Volatile%               100 %
VOC Content             N/A
Water Content           < 0.01 %
Solvent Content         N/A
Evaporation Rate        15.8
Viscosity               32 Pas              25 °C
Surface Tension         N/A
Partition Coefficient   Log Kow: 3.9 - 4.11
Decomposition Temp.     N/A
Flash Point             -14.8 °F -26 °C     Method: closed cup
Explosion Limits        Lower: 1.2 %
                        Upper: 7.7 %
Flammability            N/A
Autoignition Temp       234 °C
Refractive Index        1.375
Optical Rotation        N/A
Miscellaneous Data      N/A
Solubility              Solubility in Water: Insoluble.

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Oxidizing agents Incompatible with: chlorine, fluorine, and magnesium perchlorate.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE
Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: May cause eye irritation.
Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)
Peripheral nervous system. Kidneys. Testes.

SIGNS AND SYMPTOMS OF EXPOSURE
Prolonged or repeated contact with skin can cause defatting and dermatitis. Contact with eyes can cause redness, tearing, and blurred vision. Ingestion may cause gastrointestinal irritation. Can cause CNS depression. Exposure can cause: Lung irritation, chest pain, and edema which may be fatal. Headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.

TOXICITY DATA
Oral
Rat
25000 mg/kg
LD50
Inhalation
Rat
48,000 ppm
LC50

IRRITATION DATA

Eyes
Rabbit
10 mg
Remarks: Mild irritation effect

CHRONIC EXPOSURE - CARCINOGEN

Species: Rat
Route of Application: Inhalation
Dose: 1000 PPM
Exposure Time: 4H/59W
Frequency: I

Species: Mouse
Route of Application: Inhalation
Dose: 9018 PPM
Exposure Time: 6H/2Y
Frequency: I
Result: Tumorigenic: Neoplastic by RTECS criteria. Liver: Tumors.

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 5000 PPM/20H
Route of Application: Inhalation
Exposure Time: (6-19D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 238 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

CHRONIC EXPOSURE - MUTAGEN

Species: Hamster
Dose: 500 MG/L
Cell Type: fibroblast
Mutation test: Cytogenetic analysis

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD
Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Species: Rat
Dose: 10000 PPM/7H
Route of Application: Inhalation
Exposure Time: (15D PRE/1-18D PREG)
Result: Effects on Newborn: Behavioral.
Species: Rat
Dose: 1000 PPM/6H
Route of Application: Inhalation
Exposure Time: (8-16D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 3,878 mg/l

Test Type: EC50 Algae
Species: Chlorella vulgaris
Time: 3 h
Value: 12,840 mg/l

Test Type: EC50 Algae
Species: SKELETOMA
Time: 8 h
Value: 0.3 mg/l

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Hexanes
UN#: 1208
Class: 3
Packing Group: Packing Group II
Hazard Label: Flammable liquid
PIH: Not PIH

IATA
Proper Shipping Name: Hexanes
IATA UN Number: 1208
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: F Xn N
R: 11 38 48/20 51/53 62 65 67
Risk Statements: Highly flammable. Irritating to skin. Harmful: danger of serious damage to health by prolonged exposure through
inhalation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Possible risk of impaired fertility. Harmful: may cause lung damage if swallowed. Vapors may cause drowsiness and dizziness.

Safety Statements: Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. Do not empty into drains. Take precautionary measures against static discharges. Wear suitable protective clothing and gloves. Avoid release to the environment. Refer to special instructions/safety data sheets. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

US CLASSIFICATION AND LABEL TEXT


Risk Statements: Highly flammable. Irritating to skin. Harmful: danger of serious damage to health by prolonged exposure through inhalation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Possible risk of impaired fertility. Harmful: may cause lung damage if swallowed. Vapors may cause drowsiness and dizziness.

Safety Statements: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. Do not empty into drains. Take precautionary measures against static discharges. Wear suitable protective clothing, gloves, and eye/face protection. Avoid release to the environment. Refer to special instructions/safety data sheets. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.


UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes
DEMINIMIS: 1 %
NOTES: This product is subject to SARA section 313 reporting requirements.
TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER
For R&D use only. Not for drug, household or other uses.

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.