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

Product identifier
Product name: 1-Hexyne
Stock number: A13156, L02869
EINECS Number: 211-736-9

Relevant identified uses of the substance or mixture and uses advised against.
Sector of Use: SU24 Scientific research and development

2 Hazards identification

Classification of the substance or mixture

<table>
<thead>
<tr>
<th>GHS02 Flame</th>
</tr>
</thead>
<tbody>
<tr>
<td>H225 Highly flammable liquid and vapour.</td>
</tr>
<tr>
<td>GHS08 Health hazard</td>
</tr>
<tr>
<td>H304 May be fatal if swallowed and enters airways.</td>
</tr>
</tbody>
</table>

Classification according to Directive 67/548/EEC or Directive 1999/45/EC

- Xn: Harmful
- R65: Harmful: may cause lung damage if swallowed.
- F: Highly flammable
- R11: Highly flammable.

Labelling according to EU guidelines:

- Code letter and hazard designation of product: Xn Harmful
- F: Highly flammable

Risk phrases:
- 11 Highly flammable.
- 65 Harmful: may cause lung damage if swallowed.

Safety phrases:
- 9 Keep container in a well-ventilated place.
- 16 Keep away from sources of ignition - No smoking.
- 29 Do not empty into drains.
- 33 Take precautionary measures against static discharges.
- 62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label

Hazard description:

WHMIS classification
Material Safety Data Sheet
According to OSHA and ANSI

Product name: 1-Hexyne

Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FIRE</th>
<th>REACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Health (acute effects) = 1
Flammability = 3
Reactivity = 1

Other hazards

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances
(CAS#) Description:
1-Hexyne (CAS# 693-02-7)
Identification number(s):
EINECS Number: 211-736-9

4 First aid measures

Description of first aid measures
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing
Seek immediate medical advice.

5 Firefighting measures

Extinguishing media
Suitable extinguishing agents
In case of fire, use sand, carbon dioxide or powdered extinguishing agent. Never use water.
For safety reasons unsuitable extinguishing agents
Water
Special hazards arising from the substance or mixture
In case of fire, the following can be released:
Carbon monoxide and carbon dioxide
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources
Environmental precautions:
Do not allow material to be released to the environment without proper governmental permits.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents
Keep away from ignition sources.
Reference to other sections
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

(Contd. on page 3)
7 Handling and storage

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires:
Keep ignition sources away.
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.

Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: Store in a cool location.
Information about storage in one common storage facility:
Do not store together with oxidizing and acidic materials as well as heavy-metal compounds.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters
Components with limit values that require monitoring at the workplace: Not required.
Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands: Impervious gloves
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:
Form: Liquid
Color: Colorless
Odor: Characteristic
Odour threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/Melting range: -132°C (-206 °F)
Boiling point/Boiling range: 69-71°C (156-160 °F)
Sublimation temperature / start: Not determined

Flash point: -21°C (-6 °F)

Flammability (solid, gaseous) Not applicable.

Ignition temperature: 263°C (505 °F)

Decomposition temperature: Not determined

Auto igniting: Not determined.

Explosion limits:
Lower: Not determined
Upper: Not determined

Vapor pressure at 37°C (99 °F): 336.49 hPa (252 mm Hg)

Density at 20°C (68 °F): 0.718 g/cm³ (5.992 lbs/gal)
10 Stability and reactivity

Reactivity

Chemical stability

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions: No dangerous reactions known

Incompatible materials:
Oxidizing agents
Acids
Heavy metal powders

Hazardous decomposition products: Carbon monoxide and carbon dioxide

11 Toxicological information

Information on toxicological effects

Acute toxicity:
Primary irritant effect:
on the skin: May cause irritation
on the eye: May cause irritation

Sensitization: No sensitizing effects known.

Subacute to chronic toxicity:
Other than potential irritation (see above), no information on illness or injury to humans from acute or chronic exposure to this product is available.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information

Toxicity
Acquatic toxicity: No further relevant information available.

Behavior in environmental systems:
Bioaccumulative potential No further relevant information available.
Mobility in soil No further relevant information available.

Additional ecological information:
General notes:
Do not allow material to be released to the environment without proper governmental permits.

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

Other adverse effects No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation: Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:

Recommendation: Disposal must be made according to official regulations.
14 Transport information

DOT regulations:

| Hazard class: | 3 |
| Identification number: | UN3295 |
| Packing group: | II |
| Proper shipping name (technical name): | HYDROCARBONS, LIQUID, N.O.S. |
| Label | 3 |

Land transport ADR/RID (cross-border):

| ADR/RID class: | 3 (F1) Flammable liquids |
| Danger code (Kemler): | 33 |
| UN-Number: | 3295 |
| Packaging group: | II |
| UN proper shipping name: | 3295 HYDROCARBONS, LIQUID, N.O.S. |

Maritime transport IMDG:

| IMDG Class: | 3 |
| UN Number: | 3295 |
| Label | 3 |
| Packaging group: | II |
| Marine pollutant: | No |
| Proper shipping name: | HYDROCARBONS, LIQUID, N.O.S. |

Air transport ICAO-TI and IATA-DGR:

| ICAO/IATA Class: | 3 |
| UN/ID Number: | 3295 |
| Label | 3 |
| Packaging group: | II |
| Proper shipping name: | HYDROCARBONS, LIQUID, N.O.S. |

UN "Model Regulation": UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, II

Special precautions for user Warning: Flammable liquids

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

Product related hazard informations:

Hazard symbols:

Xn Harmful
F Highly flammable

Risk phrases:

11 Highly flammable.
65 Harmful: may cause lung damage if swallowed.

Safety phrases:

9 Keep container in a well-ventilated place.
16 Keep away from sources of ignition - No smoking.
29 Do not empty into drains.
Product name: 1-Hexyne

(Contd. of page 5)

33 Take precautionary measures against static discharges.
62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Non-Domestic Substances List (NDSSL).

Information about limitation of use: For use only by technically qualified individuals.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact:
Zachariah C. Holt
Global EHS Manager

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Transport of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)