Material Safety Data Sheet
According to OSHA and ANSI

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

Product identifier

Product name: Hexanes, mixed isomers

Stock number: 19353
CAS Number: 932112-69-1
EINECS Number: 295-570-2

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

Sector of Use SU24   Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:
During normal hours the Health, Safety and Environmental Department at (800) 343-0660. After normal hours call Carechem 24 at (866) 928-0789.

2 Hazards identification

Classification of the substance or mixture

GHS02 Flame

H225 Highly flammable liquid and vapour.

GHS08 Health hazard

H361 Suspected of damaging fertility or the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.
H304 May be fatal if swallowed and enters airways.

GHS09 Environment

H411 Toxic to aquatic life with long lasting effects.

GHS07

H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H401 Toxic to aquatic life.

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

Xn; Harmful


Xi; Irritant

R38 Irritating to skin.

F; Highly flammable

R11; Highly flammable.

N; Dangerous for the environment

(Cont'd. on page 2)
**Material Safety Data Sheet**  
**According to OSHA and ANSI**

**Product name:** Hexanes, mixed isomers

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**Risk phrases:**
- R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- R67: Vapours may cause drowsiness and dizziness.

**Label elements**

**Code letter and hazard designation of product:**
- Xn Harmful
- F Highly flammable
- N Dangerous for the environment

**Risk phrases:**
- 11 Highly flammable.
- 38 Irritating to skin.
- 48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.
- 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- 62 Possible risk of impaired fertility
- 65 Harmful: may cause lung damage if swallowed.
- 67 Vapours may cause drowsiness and dizziness

**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.
- 36/37 Wear suitable protective clothing and gloves.
- 61 Avoid release to the environment. Refer to special instructions/Safety data sheets
- 62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label

**Hazard description:**

**WHMIS classification**

**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></td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

**Health (acute effects) = *2**
**Flammability = 3**
**Reactivity = 1**

**Other hazards**

**Results of PBT and vPvB assessment**

**PBT:** Not applicable.

**vPvB:** Not applicable.

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**3 Composition/information on ingredients**

**Chemical characterization: Substances**

*(CAS#) Description:*
- Hexanes, mixed isomers (CAS# 92112-69-1)

**Identification number(s):**
- EINECS Number: 295-570-2

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**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.
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Product name: Hexanes, mixed isomers

5 Firefighting measures
Extinguishing media
Suitable extinguishing agents: CO2, sand, extinguishing powder. Do not 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:
Inform respective authorities in case of seepage into water course or sewage system.
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).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
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.

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:
Store away from oxidizing agents.
Store away from halogens.
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:

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexane</td>
<td>ppm</td>
</tr>
<tr>
<td>ACGIH TLV</td>
<td>300</td>
</tr>
<tr>
<td>Austria MAK</td>
<td>300</td>
</tr>
<tr>
<td>Belgium TWA</td>
<td>300</td>
</tr>
<tr>
<td>Denmark TWA</td>
<td>200</td>
</tr>
<tr>
<td>Finland TWA</td>
<td>300; 375-STEL</td>
</tr>
</tbody>
</table>
Material Safety Data Sheet
According to OSHA and ANSI

Printing date 05/27/2011
Reviewed on 01/05/2010

Product name: Hexanes, mixed isomers

France VME 300; 375-VLE
Germany MAK 300
Hungary TWA 500 mg/m³; 1000 mg/m³-STEL
Japan OEL 150
Korea TLV 300
Netherlands MAC-TGG 250
Norway TWA 150
Poland TWA 300 mg/m³; 1000 mg/m³-STEL
Russia TWA 150; 80-STEL
Sweden NGV 300; 370-KTV
Switzerland MAK-W 300; 600-KZG-W
United Kingdom TWA 100; 300-STEL
USA PEL 300

Benzene

<table>
<thead>
<tr>
<th></th>
<th>mg/m³</th>
<th>ml/m³</th>
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<tbody>
<tr>
<td>ACGIH TLV short term</td>
<td>1.6</td>
<td>0.5</td>
</tr>
<tr>
<td>ACGIH TLV long term</td>
<td>8</td>
<td>2.5</td>
</tr>
<tr>
<td>B VME</td>
<td>1.6</td>
<td>0.5</td>
</tr>
<tr>
<td>CH MAK</td>
<td>3.2</td>
<td>1</td>
</tr>
<tr>
<td>D TRGS 900</td>
<td>3.2</td>
<td>1</td>
</tr>
<tr>
<td>DK GV</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>GB MEL</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>I VME</td>
<td>1.6</td>
<td>0.5</td>
</tr>
<tr>
<td>N TLV</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>NL MAC-TGG</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>P VME</td>
<td>1.6</td>
<td>0.5</td>
</tr>
<tr>
<td>S NGV</td>
<td>1.5</td>
<td>0.5</td>
</tr>
<tr>
<td>SF HTP</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>USA PEL short term</td>
<td>3</td>
<td>1 ppm</td>
</tr>
<tr>
<td>USA PEL long term</td>
<td>15</td>
<td>5 ppm</td>
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Hexane isomers, other than n-hexane

<table>
<thead>
<tr>
<th></th>
<th>ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH TLV</td>
<td>500; 1000-STEL</td>
</tr>
<tr>
<td>Belgium TWA</td>
<td>500; 1000-STEL</td>
</tr>
<tr>
<td>Denmark TWA</td>
<td>300</td>
</tr>
<tr>
<td>Finland TWA</td>
<td>500; 625-STEL</td>
</tr>
<tr>
<td>France TWA</td>
<td>500</td>
</tr>
<tr>
<td>Germany TWA</td>
<td>200</td>
</tr>
<tr>
<td>Ireland TWA</td>
<td>500; 1000-STEL</td>
</tr>
<tr>
<td>Sweden TWA</td>
<td>200; 300-STEL</td>
</tr>
<tr>
<td>Switzerland TWA</td>
<td>500</td>
</tr>
</tbody>
</table>

n-Hexane

<table>
<thead>
<tr>
<th></th>
<th>ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH TLV</td>
<td>50 (skin)</td>
</tr>
<tr>
<td>Austria MAK</td>
<td>50</td>
</tr>
<tr>
<td>Belgium TWA</td>
<td>50</td>
</tr>
<tr>
<td>Denmark TWA</td>
<td>25</td>
</tr>
<tr>
<td>Finland TWA</td>
<td>50; 150-STEL</td>
</tr>
<tr>
<td>France VME</td>
<td>50</td>
</tr>
<tr>
<td>Germany MAK</td>
<td>50</td>
</tr>
<tr>
<td>Hungary TWA</td>
<td>100; 200-STEL</td>
</tr>
<tr>
<td>Japan OEL</td>
<td>40 (skin)</td>
</tr>
<tr>
<td>Korea TLV</td>
<td>50 (skin)</td>
</tr>
<tr>
<td>Netherlands MAC-TGG</td>
<td>25</td>
</tr>
<tr>
<td>Norway TWA</td>
<td>25</td>
</tr>
<tr>
<td>Poland TWA</td>
<td>100; 400-STEL</td>
</tr>
<tr>
<td>Russia TWA</td>
<td>40; 300-STEL</td>
</tr>
<tr>
<td>Sweden NGV</td>
<td>25; 50-KTV</td>
</tr>
<tr>
<td>Switzerland MAK-W</td>
<td>50; 100-KZG-W</td>
</tr>
<tr>
<td>United Kingdom TWA</td>
<td>20</td>
</tr>
<tr>
<td>USA PEL</td>
<td>500</td>
</tr>
</tbody>
</table>

Additional information: No data

Exposure controls

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. Store protective clothing separately.
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Product name: Hexanes, mixed isomers

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: Mild
- Odour threshold: Not determined.

pH-value: Not determined.

Change in condition
- Melting point/Melting range: -95°C (-139 °F)
- Boiling point/Boiling range: 65-70°C (149-158 °F)
- Sublimation temperature / start: Not determined

Flash point: < -23°C (< -9 °F)

Flammability (solid, gaseous) Not applicable.

Ignition temperature: 280°C (536 °F)

Decomposition temperature: Not determined

Auto igniting: Not determined.

Explosion limits:
- Lower: 1.2 Vol %
- Upper: 8.3 Vol %

Vapor pressure at 20°C (68 °F): 160 hPa (120 mm Hg)

Density at 20°C (68 °F): 0.67 g/cm³ (5.591 lbs/gal)

Relative density Not determined.

Vapour density Not determined.

Evaporation rate Not determined.

Solubility in / Miscibility with Water: Not miscible or difficult to mix

Segregation coefficient (n-octanol/water): Not determined.

Viscosity:
- dynamic at 20°C (68 °F): 0.31 mPas
- kinematic: Not determined.

Other information No further relevant information available.

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 Reacts with strong oxidizing agents

Incompatible materials:
- Oxidizing agents
- Halogens

Hazardous decomposition products: Carbon monoxide and carbon dioxide

11 Toxicological information

Information on toxicological effects

Acute toxicity:

Primary irritant effect:
- on the skin: Irritant to skin and mucous membranes.
- on the eye: May cause irritation

Sensitization: No sensitizing effects known.

Subacute to chronic toxicity:
- n-Hexane causes skin irritation, CNS effects, lung irritation, headache, dizziness, drowsiness. Repeated or prolonged exposure to the vapor can cause peripheral polyneuropathy. Symptoms include incoordination, slowed reaction time, blurred vision, slurred speech, facial
numbness, loss of sensation. Gradual recovery is normally found after removal from exposure.
Also causes reproductive effects in laboratory animals.
Subacute to chronic toxicity:
Cyclohexane causes irritation of the skin, eyes and respiratory tract. High concentrations have a narcotic effect. In animals, chronic exposure to cyclohexane has caused general vascular damage and lesions of the brain and viscera.
Hexanes may cause skin irritation, CNS effects, lung irritation, headache, dizziness, drowsiness.

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

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability: No further relevant information available.
Behavior in environmental systems: Bioaccumulative potential: No further relevant information available.
Mobility in soil: No further relevant information available.
Ecotoxicological effects:
Remark: Toxic for aquatic organisms
Additional ecological information:
General notes: Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
Also poisonous for fish and plankton in water bodies.
Do not allow material to be released to the environment without proper governmental permits.
Toxic for aquatic organisms
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: UN1208
Packing group: II
Proper shipping name (technical name): HEXANES
Label: flammable liquid
Remarks: Special marking with the symbol (fish and tree).

Land transport ADR/RID (cross-border)

ADR/RID class: 3 (F1) Flammable liquids
Danger code (Kemler): 33
UN-Number: 1208
**Material Safety Data Sheet**  
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<table>
<thead>
<tr>
<th>Packaging group:</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special marking:</td>
<td>Symbol (fish and tree)</td>
</tr>
<tr>
<td>UN proper shipping name:</td>
<td>1208 HEXANES</td>
</tr>
</tbody>
</table>

**Maritime transport IMDG:**

- **IMDG Class:** 3
- **UN Number:** 1208
- **Label:** 3
- **Packaging group:** II
- **Marine pollutant:** Yes (P)
- **Proper shipping name:** HEXANES

**Air transport ICAO-TI and IATA-DGR:**

- **ICAO/IATA Class:** 3
- **UN/ID Number:** 1208
- **Label:** 3
- **Packaging group:** II
- **Proper shipping name:** HEXANES

**UN "Model Regulation":** UN1208, HEXANES, 3, II

**Environmental hazards:** Environmentally hazardous substance, liquid; Marine Pollutant

**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
- N Dangerous for the environment

**Risk phrases:**
- 11 Highly flammable.
- 38 Irritating to skin.
- 40/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.
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- 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
- 65 Harmful: may cause lung damage if swallowed.
- 67 Vapours may cause drowsiness and dizziness

**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.
- 36/37 Wear suitable protective clothing and gloves.
- 61 Avoid release to the environment. Refer to special instructions/Safety data sheets
- 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.

Some or all of the components of this product are not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).

**Information about limitation of use:** For use only by technically qualified individuals.
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 Carriage 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
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
P: Marine Pollutant
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
WHMIS: Workplace Hazardous Materials Information System (Canada)