SAFETY DATA SHEET

Light Pyrolysis Oil
Version 1.10

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

Product information
Product Name: Light Pyrolysis Oil
Material: 1037438, 1037439

Company: Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:
Health:
866.442.9628 (North America)
1.832.813.4984 (International)

Transport:
CHEMTREC 800.424.9300 or 703.527.3887 (int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telex)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department: Product Safety and Toxicology Group
E-mail address: SDS@CPChem.com
Website: www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification:
- Flammable liquids, Category 3
- Skin irritation, Category 2
- Eye irritation, Category 2A
- Carcinogenicity, Category 2
- Specific target organ toxicity - repeated exposure, Category 1, Eyes, Blood
- Specific target organ toxicity - repeated exposure, Category 2, Inhalation, Auditory organs

SDS Number: 100000010942 1/18
Light Pyrolysis Oil

Aspiration hazard, Category 1

Labeling

Symbol(s):  

Signal Word: Danger

Hazard Statements:  
H226: Flammable liquid and vapor.  
H304: May be fatal if swallowed and enters airways.  
H315: Causes skin irritation.  
H319: Causes serious eye irritation.  
H351: Suspected of causing cancer.  
H372: Causes damage to organs (Eyes, Blood) through prolonged or repeated exposure.  
H373: May cause damage to organs (Auditory organs) through prolonged or repeated exposure if inhaled.

Precautionary Statements:  
Prevention:  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P210 Keep away from heat/sparks/open flames/hot surfaces.  
No smoking.  
P233 Keep container tightly closed.  
P240 Ground/bond container and receiving equipment.  
P241 Use explosion-proof electrical/ventilating/lighting/equipment.  
P242 Use only non-sparking tools.  
P243 Take precautionary measures against static discharge.  
P260 Do not breathe dust/fume/gas/mist/vapor/spray.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response:  
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.  
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P308 + P313 IF exposed or concerned: Get medical advice/attention.  
P331 Do NOT induce vomiting.  
P332 + P313 If skin irritation occurs: Get medical advice/attention.  
P337 + P313 If eye irritation persists: Get medical advice/attention.  
P362 Take off contaminated clothing and wash before reuse.  
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:  
P403 + P235 Store in a well-ventilated place. Keep cool.
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P405 Store locked up.

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

Carcinogenicity:

IARC Group 2B: Possibly carcinogenic to humans
Naphthalene 91-20-3

NTP Reasonably anticipated to be a human carcinogen
Naphthalene 91-20-3

SECTION 3: Composition/information on ingredients

Synonyms: Light Fuel Oil
Light Pyrolysis Gasoline
LPO
LFO

Molecular formula: UVCB

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam Cracked Petroleum Distillate C10-C12</td>
<td>68477-40-7</td>
<td>100</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>70 - 90</td>
</tr>
<tr>
<td>4,7-Methano-1H-indene, octahydro-</td>
<td>6004-38-2</td>
<td>30 - 50</td>
</tr>
<tr>
<td>2-Methylnaphthalene</td>
<td>91-57-6</td>
<td>10 - 20</td>
</tr>
<tr>
<td>1-Methylnaphthalene</td>
<td>90-12-0</td>
<td>1 - 10</td>
</tr>
<tr>
<td>Indene</td>
<td>95-13-6</td>
<td>1 - 10</td>
</tr>
<tr>
<td>Biphenyl</td>
<td>92-52-4</td>
<td>1 - 10</td>
</tr>
<tr>
<td>2,3-Dihydro-1H-Indene</td>
<td>496-11-7</td>
<td>1 - 10</td>
</tr>
<tr>
<td>2-Ethynaphthalene</td>
<td>939-27-5</td>
<td>1 - 10</td>
</tr>
<tr>
<td>Benzene, dimethyl-</td>
<td>1330-20-7</td>
<td>1 - 10</td>
</tr>
<tr>
<td>1-Methylindan</td>
<td>767-58-8</td>
<td>1 - 10</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>95-63-6</td>
<td>1 - 10</td>
</tr>
<tr>
<td>1-ethynaphthalene</td>
<td>1127-76-0</td>
<td>1 - 10</td>
</tr>
<tr>
<td>Substituted Aromatic Amine</td>
<td>Proprietary</td>
<td>0.1 - 1</td>
</tr>
<tr>
<td>Dicyclopentadiene</td>
<td>77-73-6</td>
<td>0 - 1</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

General advice: Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled: If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact: If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact: Immediately flush eye(s) with plenty of water. Remove contact.
### Light Pyrolysis Oil

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<table>
<thead>
<tr>
<th>Section</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>If swallowed</strong></td>
<td>Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist. Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.</td>
</tr>
</tbody>
</table>

### SECTION 5: Firefighting measures

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flash point</strong></td>
<td>54.4-93.3°C (129.9-199.9°F)</td>
</tr>
<tr>
<td><strong>Autoignition temperature</strong></td>
<td>340°C (644°F)</td>
</tr>
<tr>
<td><strong>Suitable extinguishing media</strong></td>
<td>Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.</td>
</tr>
<tr>
<td><strong>Unsuitable extinguishing media</strong></td>
<td>High volume water jet.</td>
</tr>
<tr>
<td><strong>Specific hazards during firefighting</strong></td>
<td>Do not allow run-off from fire fighting to enter drains or water courses.</td>
</tr>
<tr>
<td><strong>Special protective equipment for fire-fighters</strong></td>
<td>Wear self-contained breathing apparatus for firefighting if necessary.</td>
</tr>
<tr>
<td><strong>Further information</strong></td>
<td>Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containers. Use a water spray to cool fully closed containers.</td>
</tr>
<tr>
<td><strong>Fire and explosion protection</strong></td>
<td>Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.</td>
</tr>
<tr>
<td><strong>Hazardous decomposition products</strong></td>
<td>No data available.</td>
</tr>
</tbody>
</table>

### SECTION 6: Accidental release measures

<table>
<thead>
<tr>
<th>Precaution</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal precautions</strong></td>
<td>Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.</td>
</tr>
<tr>
<td><strong>Environmental precautions</strong></td>
<td>Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.</td>
</tr>
<tr>
<td><strong>Methods for cleaning up</strong></td>
<td>Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth,</td>
</tr>
</tbody>
</table>
vermiculite) and place in container for disposal according to local / national regulations (see section 13).

SECTION 7: Handling and storage

Handling

Advice on safe handling: Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion: Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers: No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naphthalene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>10 ppm,</td>
<td>hemolytic anemia, URT irr, cataract, A3, Skin,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15 ppm,</td>
<td>hematologic eff, URT irr, eye irr, eye dam, (, A4, Skin,</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>STEL</td>
<td>15 ppm,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1</td>
<td>TWA</td>
<td>10 ppm, 50 mg/m3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>10 ppm, 50 mg/m3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>STEL</td>
<td>15 ppm, 75 mg/m3</td>
<td></td>
</tr>
<tr>
<td>2-Methylnaphthalene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>0.5 ppm,</td>
<td>LRT irr, lung dam, A4, Skin,</td>
</tr>
<tr>
<td>1-Methylnaphthalene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>0.5 ppm,</td>
<td>LRT irr, lung dam, A4, Skin,</td>
</tr>
<tr>
<td>Indene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>5 ppm,</td>
<td>liver dam,</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>10 ppm, 45 mg/m3</td>
<td></td>
</tr>
<tr>
<td>Bipheny</td>
<td>ACGIH</td>
<td>TWA</td>
<td>0.2 ppm,</td>
<td>pulm func,</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1</td>
<td>TWA</td>
<td>0.2 ppm, 1 mg/m3</td>
<td>(b).</td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>0.2 ppm, 1 mg/m3</td>
<td></td>
</tr>
<tr>
<td>Benzene, dimethyl-</td>
<td>OSHA Z-1</td>
<td>TWA</td>
<td>100 ppm, 435 mg/m3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>STEL</td>
<td>150 ppm, 655 mg/m3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSHA Z-1-A</td>
<td>TWA</td>
<td>100 ppm, 435 mg/m3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA</td>
<td>100 ppm,</td>
<td>CNS impair, URT irr, eye irr, BEI, A4,</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>STEL</td>
<td>150 ppm,</td>
<td>CNS impair, URT irr, eye irr, BEI, A4,</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>25 ppm,</td>
<td>CNS impair, hematologic eff, asthma,</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

Light Pyrolysis Oil

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SDS Number: 100000010942

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicyclopentadiene</td>
<td>ACGIH</td>
<td>TWA 5 ppm, 30 mg/m³</td>
<td>05/18</td>
</tr>
<tr>
<td>Dicyclopentadiene</td>
<td>OSHA Z-1-A</td>
<td>TWA 5 ppm, 30 mg/m³</td>
<td>05/18</td>
</tr>
<tr>
<td>Dicyclopentadiene</td>
<td>ACGIH</td>
<td>TWA 0.5 ppm,</td>
<td>05/18</td>
</tr>
<tr>
<td>Dicyclopentadiene</td>
<td>ACGIH</td>
<td>TWA 1 ppm,</td>
<td>05/18</td>
</tr>
</tbody>
</table>

Adopted values or notations enclosed are those for which changes are proposed in the NIC

The value in mg/m³ is approximate.

A3 Confirmed animal carcinogen with unknown relevance to humans

A4 Not classifiable as a human carcinogen

asthma Asthma

B3 Confirmed animal oncogene

BEI Substances for which there is a Biological Exposure Index or Indices (see BEI® section)

CNS impair Central Nervous System impairment

eye dam Eye damage

eye irr Eye irritation

hematologic eff Hematologic effects

hemolytic Hemolytic anemia

liver dam Liver damage

LRT irr Lower Respiratory Tract irritation

lung dam Lung damage

pulm func Pulmonary function

Skin Danger of cutaneous absorption

URT irr Upper Respiratory Tract irritation

Immediately Dangerous to Life or Health Concentrations (IDLH)

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>Immediately Dangerous to Life or Health Concentration Value 250 parts per million</td>
<td>1995-03-01</td>
</tr>
<tr>
<td>Biphenyl</td>
<td>92-52-4</td>
<td>Immediately Dangerous to Life or Health Concentration Value 100 mg/m³</td>
<td>1995-03-01</td>
</tr>
<tr>
<td>Benzene, dimethyl-</td>
<td>1330-20-7</td>
<td>Immediately Dangerous to Life or Health Concentration Value 900 parts per million</td>
<td>1995-03-01</td>
</tr>
</tbody>
</table>

US

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Sampling time</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzene, dimethyl-</td>
<td>1330-20-7</td>
<td>Methylhippuric acids: 1.5 g/g creatinine (Urine)</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>2013-03-01</td>
</tr>
</tbody>
</table>

Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Full-Face Air-Purifying Respirator for Organic Vapors, Dusts and Mists. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
Hand protection: The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection: Eye wash bottle with pure water. Tightly fitting safety goggles.

Skin and body protection: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate: Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.

Hygiene measures: When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

**Appearance**
- Physical state: Liquid
- Color: Blue green

**Safety data**
- Flash point: 54.4-93.3°C (129.9-199.9°F)
- Lower explosion limit: No data available
- Upper explosion limit: No data available
- Oxidizing properties: No
- Autoignition temperature: 340°C (644°F)
- Molecular formula: UVCB
- Molecular weight: Not applicable
- pH: Not applicable
- Freezing point: 7°C (45°F)
- Pour point: No data available
- Boiling point/boiling range: 170°C (338°F)
- Vapor pressure: No data available
- Relative density: ca. 0.93 - 0.99 at 15.6 °C (60.1 °F)
Light Pyrolysis Oil

SECTION 10: Stability and reactivity

Reactivity: Stable under recommended storage conditions.

Chemical stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Hazardous reactions: Hazardous polymerization does not occur.

Further information: No decomposition if stored and applied as directed.

Hazardous reactions: Vapors may form explosive mixture with air.

Conditions to avoid: Heat, flames and sparks.

Hazardous decomposition products: No data available

Other data: No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Light Pyrolysis Oil
Acute oral toxicity: LD50: 2,890 mg/kg
Species: Rat

Light Pyrolysis Oil
Acute inhalation toxicity: LC50: > 5 mg/l
Exposure time: 4 h
Species: Rat
Test atmosphere: dust/mist
Acute toxicity estimate: > 30000 ppm
Exposure time: 4 h
Test atmosphere: gas
Method: Calculation method

**Light Pyrolysis Oil**
**Acute dermal toxicity**
- LC50: > 2,000 mg/kg
- Species: Rabbit
- Information given is based on data obtained from similar substances.
  - Acute toxicity estimate: > 5,000 mg/kg
  - Method: Calculation method
  - Acute toxicity estimate: > 5,000 mg/kg
  - Method: Calculation method

**Light Pyrolysis Oil**
**Skin irritation**
- May cause skin irritation in susceptible persons.

**Light Pyrolysis Oil**
**Eye irritation**
- May cause irreversible eye damage.

**Light Pyrolysis Oil**
**Sensitization**
- May cause sensitization of susceptible persons by skin contact.

**Repeated dose toxicity**
### Benzene, dimethyl-

| Species: Rat | Application Route: oral gavage |
| Dose: 0, 62.5, 125, 250, 500, 100... |
| Exposure time: 13 wk |
| Number of exposures: daily, 5 d/wk |
| NOEL: 1,000 mg/kg |

| Species: Rat | Application Route: Inhalation |
| Dose: 0, 180, 460, 810 ppm |
| Exposure time: 13 wk |
| Number of exposures: 6 h/d, 5 d/wk |
| NOEL: > 810 ppm |

| Species: Rat | Application Route: Inhalation |
| Dose: 0, 450, 900, 1800 ppm |
| Exposure time: 13 wk |
| Number of exposures: 6 h/d, 6 d/wk |
| Lowest observable effect level: 900 ppm |

### Dicyclopentadiene

| Species: Rat, female | Sex: female |
| Application Route: oral gavage |
| NOEL: 20 mg/kg |

| Sex: male |
| NOEL: 4 mg/kg |

### Genotoxicity in vitro

#### Naphthalene

| Test Type: Ames test |
| Result: negative |

| Test Type: Sister Chromatid Exchange Assay |
| Result: negative |

| Test Type: Unscheduled DNA synthesis assay |
| Result: negative |

#### Benzene, dimethyl-

| Test Type: Ames test |
| Result: negative |

| Test Type: Mouse lymphoma assay |
| Result: negative |

#### Dicyclopentadiene

| Test Type: Ames test |
| Result: negative |

| Test Type: Chromosome aberration test in vitro |
| Result: negative |

### Genotoxicity in vivo

#### Naphthalene

| Test Type: Mouse micronucleus assay |
| Result: negative |

#### Benzene, dimethyl-

| Test Type: Mouse micronucleus assay |
| Result: negative |
Carcinogenicity

**Naphthalene**
- Species: Mouse
- Sex: male
- Dose: 10, 30 ppm
- Exposure time: 105 weeks
- Number of exposures: 6 hours/day, 5 days/week
- Test substance: yes
- Print Date: No information available.
- Remarks: No evidence of carcinogenicity

Species: Mouse
- Sex: female
- Dose: 10, 30 ppm
- Exposure time: 105 weeks
- Number of exposures: 6 hours/day, 5 days/week
- Test substance: yes
- Print Date: No information available.
- Remarks: increased incidence of alveolar/bronchiolar adenomas

Species: Rat
- Sex: male and female
- Dose: 10, 30, 60 ppm
- Exposure time: 105 weeks
- Number of exposures: 6 hours/day, 5 days/week
- Test substance: yes
- Print Date: No information available.
- Remarks: nose respiratory epithelial adenoma, increased incidence of olfactory neuroblastomas

**Benzene, dimethyl**
- Species: Rat
- Dose: 0, 250, 500 mg/kg
- Exposure time: 103 wks
- Number of exposures: 5 d/wk
- Remarks: No evidence of carcinogenicity

Species: Mouse
- Dose: 0, 500, 1000 mg/kg
- Exposure time: 103 wks
- Number of exposures: 5 d/wk
- Remarks: No evidence of carcinogenicity

Reproductive toxicity

**Dicyclopentadiene**
- Species: Rat
- Sex: male
- Application Route: oral gavage
- NOAEL Parent: 100 mg/kg

Species: Rat
- Sex: female
- Application Route: oral gavage
- NOAEL Parent: 20 mg/kg
- NOAEL F1: 20 mg/kg

Developmental Toxicity
**Light Pyrolysis Oil**

**Version 1.10**

**Revision Date 2020-02-03**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Species</th>
<th>Application Route</th>
<th>Dose</th>
<th>Test period</th>
<th>NOAEL Teratogenicity</th>
<th>NOAEL Maternal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naphthalene</td>
<td>Rabbit</td>
<td>oral gavage</td>
<td>40, 200, 400 mg/kg</td>
<td>29 d, GD 6-18</td>
<td>400 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Naphthalene</td>
<td>Rat</td>
<td>Inhalation</td>
<td>0, 805, 1610 ppm</td>
<td>GD 7-16</td>
<td>1610 ppm</td>
<td></td>
</tr>
<tr>
<td>Naphthalene</td>
<td>Mouse</td>
<td>oral gavage</td>
<td>0, 780, 1960, 2619 mg/kg</td>
<td>GD 6-15</td>
<td>780 mg/kg</td>
<td>780 mg/kg</td>
</tr>
</tbody>
</table>

**Light Pyrolysis Oil**

**Aspiration toxicity**

May be fatal if swallowed and enters airways.

**CMR effects**

Steam Cracked Petroleum Distillate C10-C12: Carcinogenicity: Limited evidence of carcinogenicity in animal studies

Naphthalene: Carcinogenicity: Limited evidence of carcinogenicity in animal studies

Benzene, dimethyl-: Carcinogenicity: Not classifiable as a human carcinogen. Mutagenicity: Did not show mutagenic effects in animal experiments. Teratogenicity: Damage to fetus not classifiable

**Light Pyrolysis Oil**

**Further information**

Solvents may degrease the skin.

**SECTION 12: Ecological information**

**Toxicity to fish**

<table>
<thead>
<tr>
<th>Substance</th>
<th>LC50</th>
<th>Exposure time</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naphthalene</td>
<td>3.2 mg/l</td>
<td>96 h</td>
<td>Pimephales promelas (fathead minnow)</td>
</tr>
<tr>
<td>1-Methylnaphthalene</td>
<td>9 mg/l</td>
<td>96 h</td>
<td>Pimephales promelas (fathead minnow)</td>
</tr>
<tr>
<td>Benzene, dimethyl-</td>
<td>8.2 mg/l</td>
<td>96 h</td>
<td>Salmo gairdneri (Rainbow trout)</td>
</tr>
</tbody>
</table>

**Toxicity to fish**

Naphthalene: LC50: 3.2 mg/l
  Exposure time: 96 h
  Species: Pimephales promelas (fathead minnow)

1-Methylnaphthalene: LC50: 9 mg/l
  Exposure time: 96 h
  Species: Pimephales promelas (fathead minnow)

Benzene, dimethyl-: LC50: 8.2 mg/l
  Exposure time: 96 h
  Species: Salmo gairdneri (Rainbow trout)
Dicyclopentadiene : LC50: 3.7 mg/l  
Exposure time: 48 h  
Species: Oryzias latipes (Orange-red killifish)

Toxicity to daphnia and other aquatic invertebrates

Naphthalene : LC50: 2.16 mg/l  
Exposure time: 48 h  
Species: Daphnia magna (Water flea)

Dicyclopentadiene : EC50: 8.0 mg/l  
Exposure time: 48 h  
Species: Daphnia magna (Water flea)

Toxicity to algae

Naphthalene : EC50: 2.96 mg/l  
Exposure time: 48 h  
Species: Selenastrum capricornutum (algae)

Dicyclopentadiene : EC50: 27.0 mg/l  
Exposure time: 72 h  
Species: Selenastrum capricornutum (algae)

Biodegradability : Expected to be ultimately biodegradable

Elimination information (persistence and degradability)

Bioaccumulation

Benzene, dimethyl- : This material is not expected to bioaccumulate.

Additional ecological information

Ecotoxicology Assessment

Short-term (acute) aquatic hazard : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard : Very toxic to aquatic life with long lasting effects.

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

Impact on Sewage Treatment : No data available

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.
Product: The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging: Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
   UN1202, HOT GAS OIL, 3, III, MARINE POLLUTANT, (NAPHTHALENE)

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
   UN1202, HOT GAS OIL, 3, III, (54.4-93.3°C), MARINE POLLUTANT, (NAPHTHALENE, BIPHENYL)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
   UN1202, 3: NOT PERMITTED FOR TRANSPORT

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
   UN1202, HOT GAS OIL, 3, III, (D/E), ENVIRONMENTALLY HAZARDOUS, (NAPHTHALENE, BIPHENYL)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
   UN1202, HOT GAS OIL, 3, III, ENVIRONMENTALLY HAZARDOUS, (NAPHTHALENE, BIPHENYL)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
   UN1202, HOT GAS OIL, 3, III, ENVIRONMENTALLY HAZARDOUS, (NAPHTHALENE, BIPHENYL)

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards: Flammable (gases, aerosols, liquids, or solids)
Skin corrosion or irritation
Serious eye damage or eye irritation
Carcinogenicity
Specific target organ toxicity (single or repeated exposure)
Aspiration hazard

CERCLA Reportable Quantity: 124 lbs
Naphthalene

SARA 302 Reportable Quantity: This material does not contain any components with a SARA 302 RQ.

SARA 302 Threshold Planning Quantity: This material does not contain any components with a section 302 EHS TPQ.

SARA 304 Reportable Quantity: This material does not contain any components with a section 304 EHS RQ.

SARA 313 Components: The following components are subject to reporting levels established by SARA Title III, Section 313:

- Naphthalene - 91-20-3
- Biphenyl - 92-52-4
- Benzene, dimethyl- - 1330-20-7
- 1,2,4-Trimethylbenzene - 95-63-6
- Dicyclopentadiene - 77-73-6

Clean Air Act

Ozone-Depletion Potential: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):
- Naphthalene - 91-20-3
- Biphenyl - 92-52-4
- Benzene, dimethyl- - 1330-20-7

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489):

- 2-Methylnaphthalene - 91-57-6
- 1-Methylnaphthalene - 90-12-0
- Biphenyl - 92-52-4
- Benzene, dimethyl- - 1330-20-7
- 1-Ethynaphthalene - 1127-76-0

**US State Regulations**

**Pennsylvania Right To Know**

- Naphthalene - 91-20-3
- 2-Methylnaphthalene - 91-57-6
- 1-Methylnaphthalene - 90-12-0
- Naphthalene, dimethyl- - 28804-88-8
- Indene - 95-13-6
- Biphenyl - 92-52-4
- Benzene, dimethyl- - 1330-20-7
- 1,2,4-Trimethylbenzene - 95-63-6
- Dicyclopentadiene - 77-73-6

**California Prop. 65 Components**

- WARNING: This product can expose you to chemicals including [listed below], which is [are] known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov/food.

  - Naphthalene - 91-20-3

**Notification status**

- **Europe REACH**: Not in compliance with the inventory
- **Switzerland CH INV**: On the inventory, or in compliance with the inventory
- **United States of America (USA) TSCA**: On or in compliance with the active portion of the TSCA inventory
- **Canada NDSL**: On the inventory, or in compliance with the inventory
- **Australia AICS**: On the inventory, or in compliance with the inventory
- **New Zealand NZIoC**: Not in compliance with the inventory
- **Japan ENCS**: Not in compliance with the inventory
- **Korea KECI**: A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance.
- **Philippines PICCS**: Not in compliance with the inventory
Light Pyrolysis Oil

SECTION 16: Other information

NFPA Classification : Health Hazard: 2
Fire Hazard: 2
Reactivity Hazard: 0

Further information
Legacy SDS Number : PE0054

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Key or legend to abbreviations and acronyms used in the safety data sheet

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>American Conference of Government Industrial Hygienists</td>
</tr>
<tr>
<td>AICS</td>
<td>Australia, Inventory of Chemical Substances</td>
</tr>
<tr>
<td>DSL</td>
<td>Canada, Domestic Substances List</td>
</tr>
<tr>
<td>NDSL</td>
<td>Canada, Non-Domestic Substances List</td>
</tr>
<tr>
<td>CNS</td>
<td>Central Nervous System</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstract Service</td>
</tr>
<tr>
<td>EC50</td>
<td>Effective Concentration</td>
</tr>
<tr>
<td>NOAEL</td>
<td>No Observable Adverse Effect Level</td>
</tr>
<tr>
<td>EC50</td>
<td>Effective Concentration 50%</td>
</tr>
<tr>
<td>NOEC</td>
<td>No Observed Effect Concentration</td>
</tr>
<tr>
<td>EGEST</td>
<td>EOSCA Generic Exposure Scenario Tool</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health Administration</td>
</tr>
<tr>
<td>EOSCA</td>
<td>European Oilfield Specialty Chemicals Association</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
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<td>EINECS</td>
<td>European Inventory of Existing Chemical Substances</td>
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<tr>
<td>PICCS</td>
<td>Philippines Inventory of Commercial Chemical Substances</td>
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<tr>
<td>MAK</td>
<td>Germany Maximum Concentration Values</td>
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<tr>
<td>PRNT</td>
<td>Presumed Not Toxic</td>
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<tr>
<td>GHS</td>
<td>Globally Harmonized System</td>
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<tr>
<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
</tr>
<tr>
<td>&gt;=</td>
<td>Greater Than or Equal To</td>
</tr>
<tr>
<td>STEL</td>
<td>Short-term Exposure Limit</td>
</tr>
<tr>
<td>IC50</td>
<td>Inhibition Concentration 50%</td>
</tr>
<tr>
<td>SARA</td>
<td>Superfund Amendments and Reauthorization Act</td>
</tr>
<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
</tbody>
</table>
### SAFETY DATA SHEET

**Light Pyrolysis Oil**

**Version 1.10**

**Revision Date** 2020-02-03

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>IECSC</td>
<td>Inventory of Existing Chemical Substances in China</td>
</tr>
<tr>
<td>ENCS</td>
<td>Japan, Inventory of Existing and New Chemical Substances</td>
</tr>
<tr>
<td>KECI</td>
<td>Korea, Existing Chemical Inventory</td>
</tr>
<tr>
<td>&lt;=</td>
<td>Less Than or Equal To</td>
</tr>
<tr>
<td>LC50</td>
<td>Lethal Concentration 50%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA</td>
<td>Time Weighted Average</td>
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<tr>
<td>TSCA</td>
<td>Toxic Substance Control Act</td>
</tr>
<tr>
<td>UVCB</td>
<td>Unknown or Variable Composition, Complex Reaction Products, and Biological Materials</td>
</tr>
<tr>
<td>WHMIS</td>
<td>Workplace Hazardous Materials Information System</td>
</tr>
</tbody>
</table>

**SDS Number:** 100000010942