1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Naphthalene
Product Number : 84679
Brand : Fluka
Supplier : Sigma-Aldrich
Supplier Address : 3050 Spruce Street
                SAINT LOUIS MO  63103
                USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # (For both supplier and manufacturer) : (314) 776-6555
Preparation Information : Sigma-Aldrich Corporation
                        Product Safety - Americas Region
                        1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable solid, Carcinogen, Highly toxic by inhalation, Toxic by ingestion, Irritant

Target Organs
Eyes, Blood, Kidney, Lungs, Central nervous system, Liver, Heart

GHS Classification
Flammable solids (Category 1)
Acute toxicity, Oral (Category 4)
Acute toxicity, Inhalation (Category 2)
Skin irritation (Category 2)
Eye irritation (Category 2B)
Carcinogenicity (Category 2)
Acute aquatic toxicity (Category 1)

GHS Label elements, including precautionary statements

Pictogram

Signal word : Danger

Hazard statement(s)
H228 Flammable solid.
H302 Harmful if swallowed.
H315 + H320 Causes skin and eye irritation.
H330 Fatal if inhaled.
H351 Suspected of causing cancer.
H400 Very toxic to aquatic life.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P273 Avoid release to the environment.
Use personal protective equipment as required.
Wear respiratory protection.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or doctor/physician.

HMIS Classification
Health hazard: 3
Chronic Health Hazard: *
Flammability: 2
Physical hazards: 2

NFPA Rating
Health hazard: 4
Fire: 2
Reactivity Hazard: 2

Potential Health Effects
Inhalation May be fatal if inhaled. Causes respiratory tract irritation.
Skin May be harmful if absorbed through skin. Causes skin irritation.
Eyes Causes eye irritation.
Ingestion Toxic if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS
Formula: C_{10}H_8
Molecular Weight: 128.17 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
</tr>
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<tbody>
<tr>
<td>Naphthalene</td>
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<tr>
<td>CAS-No.</td>
<td>91-20-3</td>
</tr>
<tr>
<td>EC-No.</td>
<td>202-049-5</td>
</tr>
<tr>
<td>Index-No.</td>
<td>601-052-00-2</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES
General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES
Conditions of flammability
Flammable in the presence of a source of ignition, through friction or retained heat. Keep away from heat/sparks/open flame/hot surface. No smoking.

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.
Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>TWA</td>
<td>10 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td>STEL</td>
<td>15 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye &amp; Upper Respiratory Tract irritation Hematologic effects Eye damage Not classifiable as a human carcinogen Danger of cutaneous absorption</td>
<td></td>
</tr>
</tbody>
</table>

The value in mg/m³ is approximate.

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<td>TWA</td>
<td></td>
<td>10 ppm</td>
<td>50 mg/m³</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td>STEL</td>
<td></td>
<td>15 ppm</td>
<td>75 mg/m³</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td>TWA</td>
<td></td>
<td>10 ppm</td>
<td>50 mg/m³</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td>ST</td>
<td></td>
<td>15 ppm</td>
<td>75 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
</tbody>
</table>
Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection
Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form                    solid
Colour                  no data available

Safety data
pH                      no data available
Melting point/freezing point: 79.5 - 81.0 °C (175.1 - 177.8 °F)

Boiling point           218 °C (424 °F) - lit.
Flash point             80.0 °C (176.0 °F) - closed cup
Flammability (solid, gas) The substance or mixture is a flammable solid with the category 1.
Ignition temperature    526 °C (979 °F)
Autoignition temperature 526.0 °C (978.8 °F)
Lower explosion limit    0.9 %(V)
Upper explosion limit    5.9 %(V)
Vapour pressure         1.3 hPa (1.0 mmHg) at 53.0 °C (127.4 °F)
                       0.04 hPa (0.03 mmHg) at 25.0 °C (77.0 °F)
Density                 no data available
Water solubility        no data available
Partition coefficient: n-octanol/water log Pow: 3.30
Relative vapour density no data available
Odour                   no data available
Odour Threshold         no data available
10. STABILITY AND REACTIVITY

**Chemical stability**
Stable under recommended storage conditions.

**Possibility of hazardous reactions**
no data available

**Conditions to avoid**
Heat, flames and sparks. Extremes of temperature and direct sunlight.

**Materials to avoid**
Strong oxidizing agents

**Hazardous decomposition products**
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

**Acute toxicity**

**Oral LD50**
LD50 Oral - rat - 490.0 mg/kg

**Inhalation LC50**
LC50 Inhalation - rat - 1 h - > 340 mg/m3

**Dermal LD50**
LD50 Dermal - rabbit - 20,000 mg/kg

**Other information on acute toxicity**
no data available

**Skin corrosion/irritation**
no data available

**Serious eye damage/eye irritation**
Eyes - rabbit - Mild eye irritation

**Respiratory or skin sensitization**
no data available

**Germ cell mutagenicity**
no data available

**Carcinogenicity**
This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

**IARC:** 2B - Group 2B: Possibly carcinogenic to humans (Naphthalene)

**NTP:** Reasonably anticipated to be a human carcinogen (Naphthalene)

**OSHA:** No component of this product present at levels greater than or equal to 0.1% is identified as a
carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Potential health effects

<table>
<thead>
<tr>
<th>Category</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>May be fatal if inhaled. Causes respiratory tract irritation.</td>
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<td>Ingestion</td>
<td>Toxic if swallowed.</td>
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<td>Skin</td>
<td>May be harmful if absorbed through skin. Causes skin irritation.</td>
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<td>Eyes</td>
<td>Causes eye irritation.</td>
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Signs and Symptoms of Exposure
Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer. Naphthalene is retinotoxic and systemic absorption of its vapors above 15ppm, may result in; cataracts, optic neuritis, corneal injury, Eye irritation, Ingestion may provoke the following symptoms:; hemolytic anemia, hemoglobinuria, Nausea, Headache, Vomiting, Gastrointestinal disturbance, Convulsions, anemia, Kidney injury may occur., Seizures., Coma.

Synergistic effects
no data available

Additional Information
RTECS: QJ0525000

12. ECOLOGICAL INFORMATION

Toxicity

<table>
<thead>
<tr>
<th>Category</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to fish</td>
<td></td>
</tr>
<tr>
<td>LC50 - Oncorhynchus mykiss (rainbow trout)</td>
<td>0.9 - 9.8 mg/l - 96.0 h</td>
</tr>
<tr>
<td>LC50 - Pimephales promelas (fathead minnow)</td>
<td>1 - 6.5 mg/l - 96.0 h</td>
</tr>
<tr>
<td>NOEC - other fish</td>
<td>1.8 mg/l - 3.0 d</td>
</tr>
<tr>
<td>LOEC - other fish</td>
<td>3.2 mg/l - 3.0 d</td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>EC50 - Daphnia magna (Water flea) - 1.00 - 3.40 mg/l - 48 h</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>EC50 - No information available. - 33.00 mg/l - 24 h</td>
</tr>
</tbody>
</table>

Persistence and degradability

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Bioaccumulation</th>
<th>BCF</th>
</tr>
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<tbody>
<tr>
<td>Fish</td>
<td>427 - 1,158</td>
</tr>
</tbody>
</table>
Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1334   Class: 4.1   Packing group: III
Proper shipping name: Naphthalene, refined
Reportable Quantity (RQ): 100 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1334   Class: 4.1   Packing group: III
Proper shipping name: NAPHTHALENE, REFINED
Marine pollutant: No
EMS-No: F-A, S-G

IATA
UN number: 1334   Class: 4.1   Packing group: III
Proper shipping name: Naphthalene, refined

15. REGULATORY INFORMATION

OSHA Hazards
Flammable solid, Carcinogen, Highly toxic by inhalation, Toxic by ingestion, Irritant

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

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

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SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

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Pennsylvania Right To Know Components

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New Jersey Right To Know Components

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California Prop. 65 Components

<table>
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<tbody>
<tr>
<td>91-20-3</td>
<td>1990-01-01</td>
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### WARNING!
This product contains a chemical known to the State of California to cause cancer.

16. OTHER INFORMATION

Further information
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