

## Chemical Safety Data Sheet MSDS / SDS

## Phenanthrene SDS

Revision Date:2024-04-25 Revision Number:1

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

Product name: Phenanthrene  
CAS: 85-01-8

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

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.  
Uses advised against: none

**Company Identification**

Company: Chemicalbook.in  
Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090  
Telephone: +91 9550333722

**SECTION 2: Hazards identification****Classification of the substance or mixture**

Acute toxicity - Category 4, Oral

## GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Warning

Hazard statement(s)

H302 Harmful if swallowed

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

Response

P301+P317 IF SWALLOWED: Get medical help.

P330 Rinse mouth.

Storage

none

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

## SECTION 3: Composition/information on ingredients

Substance

Chemical name: Phenanthrene

Common names and synonyms: Phenanthrene

CAS number: 85-01-8  
EC number: 201-581-5  
Concentration: 100%

## SECTION 4: First aid measures

### Description of necessary first-aid measures

#### If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

#### Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

#### Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

#### Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

### Most important symptoms/effects, acute and delayed

**SYMPTOMS:** Symptoms following exposure to this compound may include skin sensitization, dermatitis, bronchitis, cough, dyspnea, respiratory neoplasm, kidney neoplasm, skin irritation, and respiratory irritation. **ACUTE/CHRONIC HAZARDS:** This compound may cause irritation to the skin and respiratory tract. When heated to decomposition it emits acrid smoke and fumes. (NTP, 1992)

### Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Aromatic hydrocarbons and related compounds

## SECTION 5: Firefighting measures

### Suitable extinguishing media

To fight fire, use water, foam, carbon dioxide or dry chem.

### Specific hazards arising from the chemical

This chemical is combustible. (NTP, 1992)

### Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

### Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

### Methods and materials for containment and cleaning up

Make up packages in paper or other flammable material.

## SECTION 7: Handling and storage

### Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

### Conditions for safe storage, including any incompatibilities

Store the container tightly closed in a dry, cool and well-ventilated place. Store apart from foodstuff containers or incompatible materials.

## SECTION 8: Exposure controls/personal protection

### Control parameters

### Occupational Exposure limit values

Component	Phenanthrene
CAS No.	85-01-8
	Occupational exposure standard: 0.1 mg/cu m for cyclohexane extractable fraction. /Coal tar pitch volatiles/ Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 0.1 mg/cu m (cyclohexane-extractable fraction). /Coal tar pitch volatiles/ NIOSH considers coal tar pitch volatiles to be potential occupational carcinogens. /Coal tar pitch volatiles/

### Biological limit values

no data available

### Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

### Individual protection measures, such as personal protective equipment (PPE)

#### Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

#### Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

#### Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

#### Thermal hazards

no data available

## SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	PHYSICAL DESCRIPTION: Colorless monoclinic crystals with a faint aromatic odor. Solutions exhibit a blue fluorescence. (NTP, 1992)
Colour:	Monoclinic plates from alcohol
Odour:	Faint aromatic odor
Melting point/freezing point:	268°C(lit.)
Boiling point or initial boiling point and boiling range:	340°C(lit.)
Flammability:	no data available
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	45°C(lit.)
Auto-ignition temperature:	no data available
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	no data available
Solubility:	less than 1 mg/mL at 79° F (NTP, 1992)
Partition coefficient n-octanol/water:	log Kow = 4.46
Vapour pressure:	1 mm Hg at 68° F (NTP, 1992)
Density and/or relative density:	1.063

Relative vapour density: 6.14 (NTP, 1992) (Relative to Air)  
Particle characteristics: no data available

## SECTION 10: Stability and reactivity

### Reactivity

80 mg/cu m; NIOSH considers coal tar pitch volatiles to be potential occupational carcinogens. Coal tar pitch volatiles

### Chemical stability

no data available

### Possibility of hazardous reactions

SLIGHT, WHEN EXPOSED TO HEAT OR FLAME. ...PHENANTHRENE may react with oxidizing materials (NTP, 1992).

### Conditions to avoid

no data available

### Incompatible materials

Combustable when exposed to heat or flame; can react vigorously with oxidizing materials

### Hazardous decomposition products

When heated to decomposition it emits acrid smoke & fumes.

## SECTION 11: Toxicological information

### Acute toxicity

Oral: LD50 Mouse oral 700 mg/kg

Inhalation: no data available

Dermal: no data available

**Skin corrosion/irritation**

no data available

**Serious eye damage/irritation**

no data available

**Respiratory or skin sensitization**

no data available

**Germ cell mutagenicity**

no data available

**Carcinogenicity**

Avail data are inadequate to permit an evaluation of the carcinogenicity of phenanthrene to exptl animals.

**Reproductive toxicity**

no data available

**STOT-single exposure**

no data available

**STOT-repeated exposure**

no data available

**Aspiration hazard**

no data available

**SECTION 12: Ecological information**



## Toxicity

Toxicity to fish: EC50; Species: *Lepomis macrochirus* (Bluegill, juvenile, 0.046 g mean final body weight); Conditions: freshwater, flow through, 19.8 deg C, pH 7.14, hardness 52.8 mg/L CaCO<sub>3</sub>, alkalinity 41.9 mg/L CaCO<sub>3</sub>, conductivity 103.6 umhos/cm, dissolved oxygen 88.1%; Concentration: 49 ug/L for 96 hr; Effect: general physiology /100% purity

Toxicity to daphnia and other aquatic invertebrates: EC50; Species: *Daphnia magna* (Water flea); Conditions: freshwater, renewal; Concentration: 349 ug/L for 7 days; Effect: decreased growth rate />99% purity

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

## Persistence and degradability

AEROBIC: Biodegradation of phenanthrene in water samples taken from several sites in the Center Hill Reservoir in Tennessee incubated at 25 deg C for 28 days was 55.52% (Feb), 65.86 to 90.25% (Mar), 80.39 to 91.75% (Apr), 79.76 to 85.76% (Jun), 49.58 to 58.84% (Aug), 67.61 to 78.46% (Sept), and 92.26 to 94.60% (Dec)(1). Phenanthrene added to water samples from two Center Hill Reservoir sites incubated at 25 deg C was 90.12 and 86.70%, 90.36 and 95.04%, 94.02 and 93.55%, 94.81 and 90.84% degraded after 1, 2, 3, and 4 weeks, respectively(1). When phenanthrene was added to Center Hill Reservoir water at 100 ug/L, the compound was 0, 66.4, 60.08, and 43.9% degraded following incubation at 25 deg C for 1, 2, 5, and 7 days respectively(1). Phenanthrene added at 1000 ug/L was 2.3, 13.5, 39.6, 22.8, and 46.1% degraded after 1, 2, 3, 4, and 5 days of incubation at 25 deg C, respectively(1). Maximum biodegradation occurred at 25 and 37 deg C when phenanthrene was added to Center Hill Reservoir samples at 100 and 1000 ug/L, respectively(1). Incubation of bacteria from Colgate Creek in Eastern Bay and Colgate Creek water resulted in 63.4 and 50.2% phenanthrene degradation respectively(2). Incubation of Eastern Bay bacteria in Colgate Creek and Eastern Bay water resulted in 85.0 and 92.4% phenanthrene degradation, respectively(2). Phenanthrene incubated in RI water at 25 ug/L degraded with half-lives of 11000, 180, and 79 days at 2, 8, and 18 deg C, respectively(3). Phenanthrene incubated in water from SC degraded with half-lives 210, 19, 24, and 36 days at temperatures of 8, 27, 28 and 27 deg C, respectively(3). The biodegradation half-lives of phenanthrene in water obtained from the Gulf of Thailand and Chao Phraya River were 35 and 37 days, respectively(4).

## Bioaccumulative potential

BCF values in sheepshead minnows exposed for 36 days to 0.12 and 1.12 ug/L of phenanthrene were 700 and 1,623, respectively(1). According to a classification scheme(2), these BCFs suggest the potential for bioconcentration in aquatic organisms is high to very high, provided the compound is not metabolized by the organism(SRC). By the action of microsomal oxidase, fish are capable of rapidly metabolizing polycyclic aromatic hydrocarbons(3). Bioaccumulation factors for fish and algae have been reported as 1,760(4). Log BCFs in algae (*Selenastrum capricornutum*) were measured at 4.22-4.47(5).

## Mobility in soil

The log K<sub>oc</sub> of phenanthrene in coarse silt fractions from sediments from Doe Run and Hickory Hill, Georgia, is 4.36(1).

Phenanthrene had reported Koc values of 9,750, 9,180, 21,080 and 11,150 in brown (Lethbridge, Alberta), dark brown (Lethbridge agricultural), black (Alberta Ellerslie Research Station) and peat (Pahokee peat) soil, respectively(2). Zook soils had phenanthrene Koc values of 13,300, 20,700, 13,100 and 16,000 in soil (%OC 2.5, %N 0.19), coarse silt (%OC 1.65, %N 0.15), pine silt (%OC 4.83, %N 0.31) and clay (%OC 4.11, %N 0.29), respectively(3). Sparta soils had phenanthrene Koc values of 18,900, 24,800, 15,800 and 253,00 in soil (%OC 2.05, %N 0.17), coarse silt (%OC 6.07, %N 0.36), pine silt (%OC 11.87, %N 0.73) and clay (%OC 9.31, %N 0.67), respectively(3). According to a classification scheme(6), this range of Koc values suggest that phenanthrene is expected to be immobile in soil. Log Koc values for phenanthrene were 7 with activated carbon, 6.6 with soot carbon, 6.5 with particulate coal, 5.5 with particulate charcoal, 5.3 with heavy fuel oil, 5.0 with coal tar, 4.9 with Pulakerogen, 4.8 with collagen, 4.7 with humic acid, 4.7 with degraded alga, 4.7 with amorphous organic matter, 4.6 with oxidized humic acid, 4.5 with cuticle, 4.4 with alga, 4.2 with lignin, 3.4 with cellulose, and 4.5 with various soils and sediments(4). Log Koc values of 7.0 and 6.5 have been observed in soot/water for phenanthrene(5).

#### **Other adverse effects**

no data available

### **SECTION 13: Disposal considerations**

#### **Disposal methods**

#### **Product**

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

#### **Contaminated packaging**

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

### **SECTION 14: Transport information**

#### **UN Number**

ADR/RID: UN3077 (For reference only, please check.)

IMDG: UN3077 (For reference only, please check.)

IATA: UN3077 (For reference only, please check.)

### **UN Proper Shipping Name**

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (For reference only, please check.)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (For reference only, please check.)

IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (For reference only, please check.)

### **Transport hazard class(es)**

ADR/RID: 9 (For reference only, please check.)

IMDG: 9 (For reference only, please check.)

IATA: 9 (For reference only, please check.)

### **Packing group, if applicable**

ADR/RID: III (For reference only, please check.)

IMDG: III (For reference only, please check.)

IATA: III (For reference only, please check.)

### **Environmental hazards**

ADR/RID: Yes

IMDG: Yes

IATA: Yes

### **Special precautions for user**

no data available

### **Transport in bulk according to IMO instruments**

no data available

## **SECTION 15: Regulatory information**

**Safety, health and environmental regulations specific for the product in question**

**European Inventory of Existing Commercial Chemical Substances (EINECS)**

Listed.

**EC Inventory**

Listed.

**United States Toxic Substances Control Act (TSCA) Inventory**

Listed.

**China Catalog of Hazardous chemicals 2015**

Not Listed.

**New Zealand Inventory of Chemicals (NZIoC)**

Listed.

**(PICCS)**

Listed.

**Vietnam National Chemical Inventory**

Listed.

**IECSC)**

Listed.

**Korea Existing Chemicals List (KECL)**

Listed.

**SECTION 16: Other information**

**Abbreviations and acronyms**

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

### References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:  
[http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:  
<http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Disclaimer: 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. We as supplier shall not be held liable for any