

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.1
Creation Date: July 15, 2019
Revision Date: April 19, 2024

SECTION 1: Identification

1.1 GHS Product identifier

Product name Phenanthrene

1.2 Other means of identification

Product number LPAH111517-ME

Other names -

1.3 Recommended use of the chemical and restrictions on use

Identified uses For laboratory and Industrial use only.

Uses advised against no data available

1.4 Supplier's details

Company CATO Research Chemicals Inc.

Address 3/F,Building B,No.179 BASIGO, Guangpu Rd East,Huangpu Dist,Guangzhou

Telephone +86-20-81960175

1.5 Emergency phone number

Emergency phone number +86-20-81960175

Service hours 'Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Acute toxicity - Category 4, Oral

2.2 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.
P301+P317 IF SWALLOWED: Get medical help.
P330 Rinse mouth.

Response

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.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Phenanthrene	Phenanthrene	85-01-8	201-581-5	100%

SECTION 4: First-aid measures

4.1 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.

4.2 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)

4.3 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: Fire-fighting measures

5.1 Suitable extinguishing media

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

5.2 Specific hazards arising from the chemical

This chemical is combustible. (NTP, 1992)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6: Accidental release measures

6.1 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.

6.2 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.

6.3 Methods and materials for containment and cleaning up

Make up packages in paper or other flammable material.

SECTION 7: Handling and storage

7.1 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.

7.2 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

8.1 Control parameters

Occupational Exposure limit values

Component	Phenanthrene
CAS No.	85-01-8

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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

8.2 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.

8.3 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/flammable 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

10.1 Reactivity

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

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

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

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

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

10.6 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

12.1 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 CaCO₃, alkalinity 41.9 mg/L CaCO₃, 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

12.2 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).

12.3 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 (*Selena strum capricornutum*) were measured at 4.22-4.47(5).

12.4 Mobility in soil

The log K_{oc} of phenanthrene in coarse silt fractions from sediments from Doe Run and Hickory Hill, Georgia, is 4.36(1). Phenanthrene had reported K_{oc} 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 K_{oc} 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 K_{oc} 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 K_{oc} values suggest that phenanthrene is expected to be immobile in soil. Log K_{oc} 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 algae, 4.7 with amorphous organic matter, 4.6 with oxidized humic acid, 4.5 with cuticle, 4.4 with algae, 4.2 with lignin, 3.4 with cellulose, and 4.5 with various soils and sediments(4). Log K_{oc} values of 7.0 and 6.5 have been observed in soot/water for phenanthrene(5).

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 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

14.1 UN Number

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

14.2 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.)

14.3 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.)

14.4 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.)

14.5 Environmental hazards

ADR/RID: Yes IMDG: Yes IATA: Yes

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

Chemical name	Common names and synonyms	CAS number	EC number
Phenanthrene	Phenanthrene	85-01-8	201-581-5
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.

Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.
Korea Existing Chemicals List (KECL)	Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019

Revision Date April 19, 2024

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
- 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/>

Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com

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