

SAFETY DATA SHEET

according to the OSHA
Hazard Communication Standard

Version 6.27
Revision Date 07/17/2026
Print Date 07/18/2026

SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : PAH - Sediment 1

Product Number : CRM104
Brand : Sigma-Aldrich

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

Identified uses : Laboratory chemicals, Synthesis of substances

Restrictions on use : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-
527-3887 CHEMTREC (International) 24
Hours/day; 7 Days/week

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Hazards for the product as supplied

Carcinogenicity : Category 1B

Short-term (acute) : Category 1

aquatic hazard

Long-term (chronic) aquatic hazard : Category 1

Other hazards

None known.

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P391 Collect spillage.
Storage:
P405 Store locked up.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

CAS-No. : Not Assigned

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
Quartz (SiO ₂)	14808-60-7*	>= 80 - <= 100	TSC

Pyrene	129-00-0*	$\geq 0 - \leq 0.1$	TSC
chrysene	218-01-9*	$\geq 0 - \leq 0.1$	TSC
Benzo[k]fluoranthene	207-08-9*	$\geq 0 - \leq 0.1$	TSC
benzo[a]pyrene	50-32-8*	$\geq 0 - \leq 0.1$	TSC
Benzo[jk]fluorene	206-44-0*	$\geq 0 - \leq 0.1$	TSC
Dibenz[a,h]anthracene	53-70-3*	$\geq 0 - \leq 0.1$	TSC
anthracene	120-12-7*	$\geq 0 - \leq 0.1$	TSC
Benzo[ghi]perylene	191-24-2*	$\geq 0 - \leq 0.1$	TSC
Benz[a]anthracene	56-55-3*	$\geq 0 - \leq 0.1$	TSC
Hexachlorobenzene	118-74-1*	$\geq 0 - \leq 0.1$	TSC
4-Bromophenyl phenyl ether	101-55-3*	$\geq 0 - \leq 0.1$	TSC

* Indicates that the identifier is a CAS No.

TSC- the actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice	: Show this safety data sheet to the doctor in attendance.
If inhaled	: After inhalation: fresh air. Call in physician.
In case of skin contact	: In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.
In case of eye contact	: After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.
If swallowed	: After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.
Most important symptoms and effects, both acute and delayed	: The most important known symptoms and effects are described in the labelling (see section 2 GHS label elements) and/or in section 11
Protection of first-aiders	: For personal protection see section 8.

Notes to physician : No data available

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media : For this substance/mixture no limitations of extinguishing agents are given.

Specific hazards during fire fighting : Not combustible.

Ambient fire may liberate hazardous vapours.

Hazardous combustion products : silicon oxides

Specific extinguishing methods : No data available

Further information : Suppress (knock down) gases/vapours/mists with a water spray jet.
Prevent fire extinguishing water from contaminating surface water or the ground water system.

Special protective equipment for fire-fighters : Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Advice for non-emergency personnel:
Avoid generation and inhalation of dusts in all circumstances.
Avoid substance contact.
Ensure adequate ventilation.
Evacuate the danger area, observe emergency procedures, consult an expert.
Advice for emergency responders:
Wear appropriate personal protective equipment, as indicated in Section 8.

- Environmental precautions : Do not let product enter drains.
- Methods and materials for containment and cleaning up : Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

SECTION 7. HANDLING AND STORAGE

For precautions see section 2 GHS label elements

- Advice on safe handling : Work under hood. Do not inhale substance/mixture.
- Further information on storage conditions : Tightly closed.
Dry.
Keep in a well-ventilated place.
Keep locked up or in an area accessible only to qualified or authorised persons.
- Storage class : 6.1D, Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects
- Recommended storage temperature : Recommended storage temperature see product label.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Quartz (SiO ₂)	14808-60-7	TWA (Respirable dust)	0.05 mg/m ³	OSHA Z-1
		TWA (respirable)	10 mg/m ³ / %SiO ₂ +2	OSHA Z-3
		TWA (respirable)	250 mppcf / %SiO ₂ +5	OSHA Z-3
		TWA (Respirable particulate)	0.025 mg/m ³ (Silica)	ACGIH

		matter)		
		PEL (respirable)	0.05 mg/m3	OSHA CARC
Pyrene	129-00-0	TWA	0.2 mg/m3	OSHA Z-1
		TWA	0.1 mg/m3	NIOSH REL
chrysene	218-01-9	TWA	0.2 mg/m3	OSHA Z-1
		TWA	0.1 mg/m3	NIOSH REL
benzo[a]pyrene	50-32-8	TWA	0.2 mg/m3	OSHA Z-1
		TWA	0.1 mg/m3	NIOSH REL
Benzo[jk]fluorene	206-44-0	TWA	0.2 mg/m3	OSHA Z-1
		TWA	0.1 mg/m3	NIOSH REL
anthracene	120-12-7	TWA	0.2 mg/m3	OSHA Z-1
		TWA	0.1 mg/m3	NIOSH REL
Hexachlorobenzene	118-74-1	TWA	0.002 mg/m3	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Control parameter s	Biological specimen	Samplin g time	Permissibl e concentrat ion	Basis
Pyrene	129-00-0	1- Hydroxypy rene	Urine	End of shift at end of workwe ek	2.5 µg/l	ACGIH BEI
chrysene	218-01-9	1- Hydroxypy rene	Urine	End of shift at end of workwe ek	2.5 µg/l	ACGIH BEI
Benzo[k]fluoranthene	207-08-9	1- Hydroxypy rene	Urine	End of shift at end of workwe ek	2.5 µg/l	ACGIH BEI
benzo[a]pyrene	50-32-8	1- Hydroxypy rene	Urine	End of shift at end of workwe ek	2.5 µg/l	ACGIH BEI
Benzo[jk]fluorene	206-44-0	1- Hydroxypy rene	Urine	End of shift at end of workwe ek	2.5 µg/l	ACGIH BEI
Dibenz[a,h]anthracene	53-70-3	1- Hydroxypy rene	Urine	End of shift at end of workwe ek	2.5 µg/l	ACGIH BEI
anthracene	120-12-7	1-	Urine	End of	2.5 µg/l	ACGIH

		Hydroxypyrene		shift at end of workweek		BEI
Benzo[ghi]perylene	191-24-2	1-Hydroxypyrene	Urine	End of shift at end of workweek	2.5 µg/l	ACGIH BEI
Benz[a]anthracene	56-55-3	1-Hydroxypyrene	Urine	End of shift at end of workweek	2.5 µg/l	ACGIH BEI

Engineering measures : No data available

Personal protective equipment

Respiratory protection : required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Recommended Filter type: : Filter type P3

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

Material : Nitrile rubber
Break through time : 480 min
Glove thickness : 0.11 mm
Protective index : Full contact
Manufacturer : KCL 741 Dermatril® L

Material : Nitrile rubber
Break through time : 480 min
Glove thickness : 0.11 mm
Protective index : Splash contact
Manufacturer : KCL 741 Dermatril® L

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The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada



Remarks	: Handle with impervious gloves. This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Eye protection	: Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses
Skin and body protection	: protective clothing
Hygiene measures	: Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: solid
Colour	: No data available
Odour	: No data available
Odour Threshold pH	: No data available : No data available
Melting point	: No data available
Boiling point/boiling range	: No data available
Flash point	: No data available
Evaporation rate	: No data available
Flammability (solid, gas)	: The product is not flammable.
Flammability (liquids)	: No data available
Burning rate	: No data available
Self-ignition	: Not applicable
Upper explosion limit / Upper flammability limit	: Not applicable

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Lower explosion limit / Lower flammability limit	: Not applicable
Vapour pressure	: No data available
Relative vapour density	: No data available
Relative density	: No data available
Density	: No data available
Water solubility	: No data available
Partition coefficient: n- octanol/water	: No data available
Autoignition temperature	: Not applicable
Decomposition temperature	: No data available
Viscosity, dynamic	: No data available
Viscosity, kinematic	: No data available
Flow time	: No data available
Explosive properties	: Not classified as explosive.
Oxidizing properties	: none
Particle characteristics Particle size	: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No data available
Chemical stability	: The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	: Violent reactions possible with:
Conditions to avoid	: no information available
Incompatible materials	: Strong oxidizing agents
Hazardous decomposition	: For Hazardous combustion products in the event of

SECTION 11. TOXICOLOGICAL INFORMATION**11.1 Information on toxicological effects****Mixture****Acute toxicity**

Oral: No data available

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

Possible carcinogen.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: OSHA specifically regulated carcinogen (Quartz (SiO₂))

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

11.2 Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Liver - Irregularities - Based on Human Evidence

Components

Quartz (SiO₂)

Acute toxicity

Oral: No data available

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Pyrene

Acute toxicity

LD50 Oral - Rat - 2,700 mg/kg

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Conjunctive irritation.

Behavioral: Excitement.

Behavioral: Muscle contraction or spasticity.
(RTECS)

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

Skin - Rabbit

Result: slight irritation

Remarks: (External MSDS)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: No eye irritation

Remarks: (External MSDS)

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure**Aspiration hazard**

No data available

chrysene**Acute toxicity**

Oral: No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

In vitro tests showed mutagenic effects

Test Type: Ames test

Test system: Salmonella typhimurium

Result: positive

Remarks: (Lit.)

Carcinogenicity

Possible human carcinogen

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Benzo[k]fluoranthene

Acute toxicity

Oral: No data available

Inhalation: Irritating to respiratory system.

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

Presumed to have carcinogenic potential for humans

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

benzo[a]pyrene

Acute toxicity

Oral: No data available

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

Skin - Mouse

Result: Mild skin irritation

Remarks: (RTECS)

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

May cause allergic skin reaction. Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Germ cell mutagenicity

May cause genetic defects.

Test Type: Ames test
Test system: Salmonella typhimurium
Result: positive
Remarks: (Lit.)
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: Chinese hamster ovary cells
Result: positive
Remarks: (National Toxicology Program)
Test Type: sister chromatid exchange assay
Test system: Chinese hamster ovary cells
Result: positive
Remarks: (National Toxicology Program)
Species: Mouse - male - Bone marrow
Result: positive
Remarks: (National Toxicology Program)

Carcinogenicity

Presumed to have carcinogenic potential for humans

Reproductive toxicity

May damage the unborn child.

May damage fertility.

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Benzo[jk]fluorene

Acute toxicity

LD50 Oral - Rat - 2,000 mg/kg

Remarks: (RTECS)

Inhalation: No data available

LD50 Dermal - Rabbit - 3,180 mg/kg

Remarks: (RTECS)

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Dibenz[a,h]anthracene**Acute toxicity**

Oral: No data available

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

Presumed to have carcinogenic potential for humans

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

anthracene**Acute toxicity**

LD50 Oral - Mouse - 4,900 mg/kg

Remarks: (RTECS)

Inhalation: No data available

LD50 Dermal - Rat - male and female - > 1,320 mg/kg

Remarks: (ECHA)

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 24 h

Remarks: (ECHA)

Remarks: Possible damages:

Dermatitis

Serious eye damage/eye irritation

Eyes - Rabbit

Result: No eye irritation - 24 - 72 h

Remarks: (ECHA)

Respiratory or skin sensitization

Intracutaneous test - Guinea pig

Result: negative

Remarks: (ECHA)

Germ cell mutagenicity

Test Type: In vitro mammalian cell gene mutation test

Test system: Mouse lymphoma test

Result: negative

Test Type: Ames test

Test system: Salmonella typhimurium

Result: negative

Remarks: (ECHA)

Test Type: Chromosome aberration test in vitro

Test system: rat hepatocytes

Result: negative

Method: OECD Test Guideline 474

Species: Mouse - Bone marrow

Result: negative

Carcinogenicity

No data available

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Benzo[ghi]perylene**Acute toxicity**

Oral: No data available

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

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Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Benz[a]anthracene**Acute toxicity**

Oral: No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

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 probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Hexachlorobenzene**Acute toxicity**

LD50 Oral - Rat - 10,000 mg/kg

LD50 Oral - Mouse - 4,000 mg/kg

LD50 Oral - Cat - 1,700 mg/kg

LD50 Oral - Rabbit - 2,600 mg/kg

LD50 Oral - Guinea pig - > 3,000 mg/kg

LD50 Oral - Quail - > 6,400 mg/kg

LD50 Oral - Mammal - > 5,000 mg/kg

Remarks: Behavioral:Somnolence (general depressed activity).

Behavioral:Change in motor activity (specific assay).

LC50 Inhalation - Rat - 3,600 mg/m³ - dust/mist

LC50 Inhalation - Mouse - 4,000 mg/m³ - dust/mist

LC50 Inhalation - Cat - 1,600 mg/m³ - dust/mist

LC50 Inhalation - Rabbit - 1,800 mg/m³ - dust/mist

Dermal: No data available

No data available

Skin corrosion/irritation

Remarks: No data available

Serious eye damage/eye irritation

Remarks: No data available

Respiratory or skin sensitization

Causes photosensitivity. Exposure to light can result in allergic reactions resulting in dermatologic lesions, which can vary from sunburnlike responses to edematous, vesiculated lesions, or bullae

Germ cell mutagenicity

No data available

Carcinogenicity

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

Possible human carcinogen

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

Ingestion - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard

No data available

4-Bromophenyl phenyl ether

Acute toxicity

Oral: No data available
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation

Remarks: No data available

Serious eye damage/eye irritation

Remarks: No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Reproductive toxicity

No data available
No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity**Components:****Pyrene:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 2
mg/l
Exposure time: 96 h
Remarks: (External MSDS)

Toxicity to daphnia and : EC50 (Daphnia magna (Water flea)): 0.002 - 0.003
other aquatic mg/l
invertebrates Exposure time: 48 h

Remarks: (External MSDS)

Toxicity to algae/aquatic plants : NOEC (Raphidocelis subcapitata (freshwater green alga)): 0.0012 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Remarks: (ECHA)

M-Factor (Acute aquatic toxicity) : 100

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC10 (Ceriodaphnia dubia (water flea)): 0.002 mg/l
End point: mortality
Exposure time: 7 d
Test Type: semi-static test
Analytical monitoring: yes
Remarks: (ECHA)

M-Factor (Chronic aquatic toxicity) : 10

chrysene:

Toxicity to fish : LC50 : 0.1 mg/l
Exposure time: 96 h

M-Factor (Acute aquatic toxicity) : 10

M-Factor (Chronic aquatic toxicity) : 10

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Benzo[k]fluoranthene:

Toxicity to fish : Remarks: No data available

M-Factor (Acute aquatic toxicity) : 10

M-Factor (Chronic aquatic toxicity) : 10

benzo[a]pyrene:

Toxicity to daphnia and other aquatic : EC50 (Daphnia magna (Water flea)): 0.25 mg/l
End point: mortality

Exposure time: 48 h
Remarks: (above the solubility limit in the test medium)
(ECOTOX Database)

Toxicity to algae/aquatic plants : ErC50 (*Scenedesmus acutus*): 0.005 mg/l
Exposure time: 72 h
Test Type: static test
Remarks: (ECOTOX Database)

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.0077 mg/l
End point: mortality
Exposure time: 96 h
Test Type: flow-through test
Remarks: (ECOTOX Database)

Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 0.117 mg/l End point: mortality Exposure time: 48 h Remarks: (ECOTOX Database)
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M-Factor (Acute aquatic toxicity) : 100

Toxicity to fish (Chronic toxicity)	: NOEC (Pimephales promelas (fathead minnow)): 0.0014 mg/l End point: mortality Exposure time: 32 d Test Type: flow-through test Remarks: (ECOTOX Database)
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Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC (Daphnia magna (Water flea)): 0.0014 mg/l Exposure time: 21 d Test Type: Reproduction Test Remarks: (ECOTOX Database)
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M-Factor (Chronic aquatic : 10 toxicity)

M-Factor (Acute aquatic toxicity) : 100

M-Factor (Chronic aquatic : 100
toxicity)

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

anthracene:

Toxicity to fish : LC50 (*Lepomis macrochirus* (Bluegill)): 0.002 mg/l
End point: Immobilization
Exposure time: 96.0 h
Test Type: flow-through test
Analytical monitoring: yes
Remarks: (ECHA)

Toxicity to daphnia and : LC50 (*Daphnia magna* (Water flea)): 0.036 mg/l
other aquatic
invertebrates End point: mortality
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202

M-Factor (Acute aquatic : 100
toxicity)

Toxicity to daphnia and : EC10 (*Ceriodaphnia dubia* (water flea)): > 0.0034
other aquatic mg/l
invertebrates (Chronic End point: mortality
toxicity) Exposure time: 7 d
Test Type: semi-static test
Analytical monitoring: yes
Remarks: (ECHA)

M-Factor (Chronic aquatic : 100
toxicity)

Benzo[ghi]perylene:

Toxicity to daphnia and : EC50 (*Daphnia magna* (Water flea)): 0.0002 mg/l
other aquatic Exposure time: 48 h
invertebrates Test Type: static test

Toxicity to algae/aquatic : EC10 (*Pseudokirchneriella subcapitata* (green algae)):
plants > 0.0016 mg/l
Exposure time: 72 h
Test Type: Growth rate

M-Factor (Acute aquatic : 1,000
toxicity)

M-Factor (Chronic aquatic : 1,000

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toxicity)

Benz[a]anthracene:

Toxicity to fish : Remarks: No data available

M-Factor (Acute aquatic toxicity) : 10

M-Factor (Chronic aquatic toxicity) : 10

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Hexachlorobenzene:

Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill)): 7.6 mg/l
Exposure time: 96.0 h

NOEC (Pimephales promelas (fathead minnow)): > 0.0048 mg/l
Exposure time: 96.0 h

LC50 : 0.1 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 0.005 mg/l
Exposure time: 48 h
Test Type: Immobilization

M-Factor (Acute aquatic toxicity) : 100

4-Bromophenyl phenyl ether:

Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill)): 50.9 mg/l
Exposure time: 24.0 h

LC50 (Lepomis macrochirus (Bluegill)): 9.6 mg/l
Exposure time: 48.0 h

LC50 : 0.1 mg/l
Exposure time: 96 h

M-Factor (Acute aquatic toxicity) : 10

M-Factor (Chronic aquatic toxicity) : 10

Persistence and degradability

Components:

Quartz (SiO₂):

Biodegradability : Remarks: The methods for determining the biological degradability are not applicable to inorganic substances.

Pyrene:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 13 %
Exposure time: 28 d
Remarks: (HSDB)

chrysene:

Biodegradability : Remarks: No data available

anthracene:

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Concentration: 100 mg/l
Result: Not readily biodegradable.
Biodegradation: 3.6 %
Exposure time: 28 d
Method: OECD Test Guideline 302C

Hexachlorobenzene:

Biodegradability : Remarks: No data available

4-Bromophenyl phenyl ether:

Biodegradability : Remarks: No data available

Bioaccumulative potential

Components:

Quartz (SiO₂):

Partition coefficient: n-octanol/water : Remarks: Not applicable for inorganic substances

Pyrene:

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 4,810
Exposure time: 2 d
Concentration: 0.056 mg/l
Remarks: (External MSDS)

Partition coefficient: n-octanol/water : log Pow: ca. 5.43 (86 °F / 30 °C)
pH: 5 - 8
Method: OECD Test Guideline 117
Remarks: Potential bioaccumulation

chrysene:

Partition coefficient: n-octanol/water : log Pow: 5.73
Remarks: Potential bioaccumulation (HSDB)

Benzo[k]fluoranthene:

Partition coefficient: n-octanol/water : log Pow: 6.188 (77 °F / 25 °C)
Remarks: Potential bioaccumulation

benzo[a]pyrene:

Bioaccumulation : Species: Lepomis macrochirus (Bluegill)
Bioconcentration factor (BCF): 3,208
Exposure time: 48 h
Concentration: 0.0005 mg/l

anthracene:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 2,615
Exposure time: 42 d
Temperature: 77 °F / 25 °C
Concentration: 0.015 mg/l
Method: OECD Test Guideline 305

Partition coefficient: n-octanol/water : log Pow: ca. 4.65 (68 °F / 20 °C)
pH: 7
Method: OECD Test Guideline 117
Remarks: Potential bioaccumulation

Benzo[ghi]perylene:

Partition coefficient: n-octanol/water : log Pow: 6.22 (77 °F / 25 °C)
Remarks: Potential bioaccumulation

Hexachlorobenzene:

Bioaccumulation : Species: Pimephales promelas (fathead minnow)
Bioconcentration factor (BCF): 22,000
Exposure time: 32 d
Concentration: 0.0003 mg/l

4-Bromophenyl phenyl ether:

Bioaccumulation : Remarks: No data available

Partition coefficient: n- : log Pow: 4.34
octanol/water

Mobility in soil

Components:

Hexachlorobenzene:

Stability in soil : Remarks: No data available

4-Bromophenyl phenyl ether:

Stability in soil : Remarks: No data available

Other adverse effects

Product:

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: 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).

Components:

chrysene:

Additional ecological : Discharge into the environment must be avoided.
information

Dibenz[a,h]anthracene:

Additional ecological : Discharge into the environment must be avoided.
information

anthracene:

Additional ecological : Discharge into the environment must be avoided.
information

Benz[a]anthracene:

Additional ecological : Discharge into the environment must be avoided.
information

Endocrine disrupting properties

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No. : UN 3077
Proper shipping name : Environmentally hazardous substance, solid, n.o.s. (1,2-Dichlorobenzene, Pyrene)
Class : 9
Packing group : III
Labels : Class 9 - Miscellaneous dangerous substances and articles
Packing instruction (cargo aircraft) : 956
Packing instruction (passenger aircraft) : 956

IMDG-Code

UN number : UN 3077
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (1,2-Dichlorobenzene, Pyrene)
Class : 9
Packing group : III
Labels : 9
EmS Code : F-A, S-F
Marine pollutant : yes

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

National Regulations

49 CFR

UN/ID/NA number : UN 3077
Proper shipping name : Environmentally hazardous substance, solid, n.o.s. (1,2-Dichlorobenzene, Pyrene)
Class : 9
Packing group : III
Labels : Class 9 - Miscellaneous dangerous substances and articles
ERG Code : 171

Marine pollutant : no
Poison Inhalation Hazard : No

Special precautions for user

Remarks : EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Benzo[b]fluoranthene	205-99-2	1	1001
benzo[a]pyrene	50-32-8	1	1001
Dibenz[a,h]anthracene	53-70-3	1	1001
2,4,5-Trichlorophenol	95-95-4	10	10 (D041)
2,4,5-Trichlorophenol	95-95-4	1	1 (F027)
2,4,6,-Trichlorophenol	88-06-2	1	1 (F027)
Hexachlorobenzene	118-74-1	10	10 (D032)
2,4-dinitrotoluene	121-14-2	10	10 (D030)
1,2-Dichlorobenzene	95-50-1	10	10 (F002)
2,4,6,-Trichlorophenol	88-06-2	10	10 (D042)

SARA 304 Extremely Hazardous Substances Reportable Quantity

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Chronic Health Hazard

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

Benzo[b]fluoranthene	205-99-2	< 0.1 %
Benzo[k]fluoranthene	207-08-9	< 0.1 %

benzo[a]pyrene	50-32-8	< 0.1 %
Dibenz[a,h]anthracene	53-70-3	< 0.1 %
Benz[a]anthracene	56-55-3	< 0.1 %
chrysene	218-01-9	< 0.1 %
Benzo[jk]fluorene	206-44-0	< 0.1 %
Benzo[ghi]perylene	191-24-2	< 0.1 %
Hexachlorobenzene	118-74-1	< 0.1 %

Clean Air Act

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).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

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).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Naphthalene	91-20-3	>= 0 - < 0.1 %
2,4,5-Trichlorophenol	95-95-4	>= 0 - < 0.1 %
Phenol	108-95-2	>= 0 - < 0.1 %
dibutyl phthalate	84-74-2	>= 0 - < 0.1 %
2,4-dinitrotoluene	121-14-2	>= 0 - < 0.1 %
1,2-Dichlorobenzene	95-50-1	>= 0 - < 0.1 %
2-nitrophenol	88-75-5	>= 0 - < 0.1 %
2,4,6,-Trichlorophenol	88-06-2	>= 0 - < 0.1 %

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Naphthalene	91-20-3	>= 0 - < 0.1 %
Phenol	108-95-2	>= 0 - < 0.1 %
dibutyl phthalate	84-74-2	>= 0 - < 0.1 %

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations

Massachusetts Right To Know

Quartz (SiO ₂)	14808-60-7
Pyrene	129-00-0
Benzo[b]fluoranthene	205-99-2
chrysene	218-01-9
Benzo[k]fluoranthene	207-08-9
benzo[a]pyrene	50-32-8
Dibenz[a,h]anthracene	53-70-3
Benz[a]anthracene	56-55-3
Phenol	108-95-2
Hexachlorobenzene	118-74-1
Bis(2-ethylhexyl) phthalate	117-81-7
2,4-dinitrotoluene	121-14-2
2,4,6,-Trichlorophenol	88-06-2

Pennsylvania Right To Know

Quartz (SiO ₂)	14808-60-7
Pyrene	129-00-0
Benzo[b]fluoranthene	205-99-2
chrysene	218-01-9
Benzo[k]fluoranthene	207-08-9
benzo[a]pyrene	50-32-8
Benzo[jk]fluorene	206-44-0
Dibenz[a,h]anthracene	53-70-3
anthracene	120-12-7
Benzo[ghi]perylene	191-24-2
acenaphthene	83-32-9
phenanthrene	85-01-8
Benz[a]anthracene	56-55-3
Fluorene	86-73-7
Benzyl butyl phthalate	85-68-7
2,4,5-Trichlorophenol	95-95-4
Phenol	108-95-2
dibutyl phthalate	84-74-2
Hexachlorobenzene	118-74-1
1,2,4-trichlorobenzene	120-82-1
Bis(2-ethylhexyl) phthalate	117-81-7
Diethyl phthalate	84-66-2
Dibenzofuran	132-64-9
2,4-dinitrotoluene	121-14-2
1,2-Dichlorobenzene	95-50-1
2-nitrophenol	88-75-5
4-Bromophenyl phenyl ether	101-55-3
2,4,6,-Trichlorophenol	88-06-2

Maine Chemicals of High Concern

Quartz (SiO ₂)	14808-60-7
Hexachlorobenzene	118-74-1

Vermont Chemicals of High Concern

Benzyl butyl phthalate	85-68-7
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Phenol	108-95-2
dibutyl phthalate	84-74-2
Hexachlorobenzene	118-74-1
Bis(2-ethylhexyl) phthalate	117-81-7
Diethyl phthalate	84-66-2

Washington Chemicals of High Concern

Benzyl butyl phthalate	85-68-7
Phenol	108-95-2
dibutyl phthalate	84-74-2
Hexachlorobenzene	118-74-1
Bis(2-ethylhexyl) phthalate	117-81-7
Diethyl phthalate	84-66-2

California Prop. 65

WARNING: This product can expose you to chemicals including Pyrene, Benzo[b]fluoranthene, chrysene, Benzo[k]fluoranthene, benzo[a]pyrene, Dibenz[a,h]anthracene, anthracene, Benzo[ghi]perylene, acenaphthene, phenanthrene, Benz[a]anthracene, Fluorene, Hexachlorobenzene, Bis(2-ethylhexyl) phthalate, 2,4-dinitrotoluene, 2,4,6-Trichlorophenol, which is/are known to the State of California to cause cancer, and Benzyl butyl phthalate, dibutyl phthalate, Hexachlorobenzene, Bis(2-ethylhexyl) phthalate, 2,4-dinitrotoluene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov. **International Regulations**

Stockholm Convention (Persistent Organic Pollutants) : Hexachlorobenzene

The components of this product are reported in the following inventories:

US TSCA : Product contains substance(s) not listed on TSCA inventory.

TSCA list

The following substance(s) is/are subject to a Significant New Use Rule:

4-Bromophenyl phenyl ether 101-55-3 See 40 CFR § 721.3430; Final Rule

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	: ACGIH - Biological Exposure Indices (BEI)
NIOSH REL	: USA. NIOSH Recommended Exposure Limits
OSHA CARC	: OSHA Specifically Regulated Chemicals/Carcinogens
OSHA Z-1	: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-3	: USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts

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The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada

**MILLIPORE
SIGMA**

ACGIH / TWA	: 8-hour, time-weighted average
NIOSH REL / TWA	: Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA CARC / PEL	: Permissible exposure limit (PEL)
OSHA Z-1 / TWA	: 8-hour time weighted average
OSHA Z-3 / TWA	: 8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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