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-----ISO 9001: 2015-----

MATERIAL SAFETY DATA SHEET

1. Identification

1.1 GHS Product identifier

Anthracene, 96%
Code A 2465

2. Hazard identification

2.1 Classification of the substance or mixture

Not classified.

2.2 GHS label elements, including precautionary statements

Pictogram(s) No symbol.
Signal word No signal word.
Hazard statement(s) none
Precautionary statement(s)
Prevention none
Response none
Storage none
Disposal none

2.3 Other hazards which do not result in classification

none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
anthracene	anthracene	120-12-7	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Refer for medical attention.

In case of skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap.

In case of eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

If swallowed

Rinse mouth. Rest. Refer for medical attention.

4.2 Most important symptoms/effects, acute and delayed

Inhalation of dust irritates nose and throat. Contact with eyes causes irritation. (USCG, 1999)

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

/SRP:/ 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/

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

To fight fire, use water, foam, carbon dioxide, water spray or mist, dry chemical.

5.2 Specific hazards arising from the chemical

This chemical is combustible.

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Sweep spilled substance into covered containers. Carefully collect remainder. Then store and dispose of according to local regulations. Do NOT let this chemical enter the environment. Personal protection: P2 filter respirator for harmful particles.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Separated from strong oxidants. Well closed. Must be stored in places cool enough to prevent accidental ignition ... Provide adequate ventilation ... Locate storage area well away from areas of fire hazard ... Kept apart from powerful oxidizing agents ...

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

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

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

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

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. 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. 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

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state

yellowish flakes

Colour

Monoclinic plates from alcohol recrystallization; when pure, colorless with violet fluorescence

Odour

Weak aromatic odor

Melting point/ freezing point

80°C (lit.)

Boiling point or initial boiling

340°C (lit.)

point and boiling range

Flammability

Combustible.

Lower and upper explosion

Lower flammable limit: 0.6% by volume; /No upper limit available/

limit / flammability limit

Flash point

121°C

Auto-ignition temperature

540°C

Decomposition temperature

no data available

pH

no data available

Kinematic viscosity

no data available

Solubility

In water: 0.045 mg/L (25 °C)

Partition coefficient n-

log Kow = 4.45

octanol/water (log value)

Vapour pressure

1 mm Hg (145 °C)

Density and/or relative

1.28

density

Relative vapour density

6.15 (vs air)

Particle characteristics

no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Darkens in sunlight

10.3 Possibility of hazardous reactions

COMBUSTIBLE WHEN EXPOSED TO HEAT, FLAME, OR OXIDIZING MATERIALS. Dust explosion possible if in powder or granular form, mixed with air. ANTHRACENE will spontaneously burst into flame on contact with chromic acid, and other strong oxidants.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Anthracene will burst into flame on contact with chromic acid.

10.6 Hazardous decomposition products

Thermal decomposition products include carbon dioxide, carbon monoxide, and organic compounds. /Aromatic hydrocarbons and related compounds/

11. Toxicological information

Acute toxicity

Oral: LD50 Mouse oral >17 g/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

No data are available in humans. Inadequate evidence of carcinogenicity in animals. OVERALL EVALUATION: Group 3: The agent is not classifiable as to its carcinogenicity to humans.

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

Toxicity to fish: LC50; Species: *Lepomis macrochirus* (Bluegill sunfish, juvenile); Concentration: 11.9 ug/L for 96 hr /Phototoxicity study; Conditions of bioassay not specified

Toxicity to daphnia and other aquatic invertebrates: EC50; Species: *Daphnia magna* (Water flea, age <24 hr); Conditions: freshwater, static; Concentration: 211 ug/L for 24 hr (95% confidence interval: 189-236 ug/L); Effect: intoxication, immobilization /> or =97% purity

Toxicity to algae: EC50; Species: *Scenedesmus subspicatus* (Green algae, log growth phase 10000 cells/mL); Conditions: freshwater, static, 25°C; Concentration: 1040 ug/L for 7 days; Effect: decreased population growth rate />98% purity

Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: The biodegradability of anthracene with natural sediments and natural estuarine waters has been studied. The biodegradation of anthracene in aquatic media is controlled by the temperature, oxygen content and acclimatization or nonacclimatization of the microorganisms. Higher biodegradation rates were observed at 30°C than at 20 and 10°C. The biodegradation process was found to be aerobic and higher oxygen concentration up to a certain optimum value tended to increase the oxidation rates. Similarly, the biodegradation rates were reported to be faster with acclimatized microorganisms. The incubation of anthracene with intertidal sediment slurries for a reasonable period of time (approx 1 month) not only produces the mineralization product carbon dioxide but also produces intermediate metabolites. A large portion of the initial material or its intermediate metabolites (which could not be identified because (14)carbon counting of the combustion products of residue was used as the method of quantification) remained cellular bound.

12.3 Bioaccumulative potential

BCFs were measured in the following aquatic species: Goldfish, 162(1); *Gambusia* (fish), 1029(2); Rainbow trout, 4400 to 9200(3); *Daphnia pulex*, 759 to 912(4,5); *Chlorella fusca* variety *vacuolata* (green algae), 7760(6); Golden orfe, 912(7); *Pontoporeia hoyi* (scud), 17,000(8); and midge (*Chironomus riparius*), 46.7(9). A BCF of 7300 was measured in guppies, *Poecilia reticulata*, in static bioconcentration experiments(10). BCF values of 1660 to 2820 and 903 to 2710 were determined in carp using flow-through conditions and anthracene concns of 15 and 1.5 ug/L, respectively(11). According to a classification scheme(12), these BCFs suggest that bioconcentration in aquatic organisms ranges from moderate to very high(SRC). The BCF in *Daphnia magna* was found to decrease with increasing concn of Aldrich humic acids: BCF (dissolved organic carbon, mg/L), 607 (0.2) and 319 (2.0); however, this difference was not considered significant due to the large sample variance(13). Aldrich humic acids in water did not significantly alter *Daphnia magna* accumulation of anthracene: BCF (dissolved organic carbon, mg/L), 389 (0.3), 362 (1.5), and 340 (5.7)(13). Depuration half-lives of 57 and 63 hours relative to contaminated and clean water, respectively, were measured in Zebrafish, *Brachydanio rerio*, exposed to (14)C-labeled anthracene adsorbed on sediment(14).

12.4 Mobility in soil

The possibility of leaching of anthracene from soil to groundwater will depend on soil type. The Koc value for anthracene is 26,000. This indicates that anthracene will be adsorbed strongly to soil and the compound may degrade before it reaches groundwater. Filtration of polluted surface water containing anthracene through sandy soil at a residence time of 100 days did not completely eliminate anthracene in the filtered water. The passage of anthracene through the soil was explained as a breakthrough of the chemical because of the saturation of active sorption sites.

12.5 Other adverse effects
no data available

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.

14. Transport information

14.1 UN Number

ADR/RID: UN3077

IMDG: UN3077

IATA: UN3077

14.2 UN Proper Shipping Name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

14.3 Transport hazard class(es)

ADR/RID: 9

IMDG: 9

IATA: 9

14.4 Packing group, if applicable

ADR/RID: III

IMDG: III

IATA: III

14.5 Environmental hazards

ADR/RID: no

IMDG: no

IATA: no

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

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
anthracene	anthracene	120-12-7	none
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			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Not Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.