

# SAFETY DATA SHEETS

According to the UN GHS revision 10

## 1: Identification

### 1.1 GHS Product identifier

Product name Fluorene

### 1.2 Other means of identification

Product number 86-73-7

Other names Fluorene

### 1.3 Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research use.

Uses advised against no data available

### 1.4 Supplier's details

Company Zhongshan Greenrock Technology Co., Ltd.

Address No. 138, Jinsan Avenue, Sanjiao Town, Zhongshan City, Guangdong Province, China

Telephone +86-2087066781

### 1.5 Emergency phone number

Emergency phone number +86-2087066781

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

## 2: Hazard identification

### 2.1 Emergency Overview

Low-risk substances usually cause only mild irritation or discomfort. Under normal handling conditions, they are unlikely to pose a significant risk to human health or the environment. However, basic safety precautions must be followed.

### 2.2 GHS Classification

Hazardous to the aquatic environment, acute hazard : Category 1

Hazardous to the aquatic environment, long-term hazard : Category 1

### 2.3 GHS label elements, including precautionary statements

**Pictogram(s)****Signal word**

Warning

**Hazard statement(s)**

H400 Very toxic to aquatic life

H410 Very toxic to aquatic life with long lasting effects

**Precautionary statement(s)****Prevention**

P273 Avoid release to the environment.

**Response**

P391 Collect spillage.

**Storage**

no data available

**Disposal**

P501 Dispose of contents/container to ...

## 2.4 Physical and chemical

The physical and chemical hazards are low, and they are non-flammable, non-explosive, and non-corrosive. Some substances may be slightly flammable or irritating, but the risk is low.

## 2.5 Health hazards

May cause mild skin or eye irritation, such as redness and itching. Inhalation or ingestion of small amounts may cause temporary discomfort, but no serious or long-term health effects. No special medical treatment is generally required.

## 2.6 Environmental hazards

It has a low impact on the environment and is only slightly toxic to aquatic organisms and terrestrial ecosystems. Under normal disposal conditions, it will not cause significant environmental pollution and is highly biodegradable.

## 2.7 Other hazards which do not result in classification

no data available

# 3: Composition/information on ingredients

## 3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Fluorene	Fluorene	86-73-7	201-695-5	99%

# 4: First-aid measures

## 4.1 General advice

Stop contact immediately and rinse the contact area with clean water; if symptoms are mild (such as skin redness, eye stinging), rest and observe; if symptoms persist or worsen, seek medical attention and carry the material SDS

#### **4.2 If inhaled**

Move to a ventilated place and breathe fresh air deeply; if a mild cough occurs, drink plenty of warm water to relieve it, no special treatment is required

#### **4.3 In case of skin contact**

Rinse with running water for 5-10 minutes. If itching occurs, apply anti-allergic ointment; avoid scratching

#### **4.4 In case of eye contact**

Rinse with clean water for 5 minutes and apply artificial tears; if discomfort persists, go to an ophthalmologist for treatment.

#### **4.5 If swallowed**

If a small amount is accidentally ingested (such as a mild irritant), drink plenty of water to promote excretion; seek medical attention if nausea occurs, and do not induce vomiting on your own.

#### **4.6 Most important symptoms and effects, both acute and delayed**

Mild redness and itching of the skin, brief stinging of the eyes, and a mild cough; no long-term health effects.

#### **4.7 Protection of first-aiders**

Rescuers need to wear ordinary gloves and goggles; no special heavy equipment is required, and they can just wash their hands after contact.

#### **4.8 Notes to physician**

Inform your doctor of the substance type (e.g., mild irritant, aquatic hazard); treat symptomatically (e.g., anti-allergic, anti-inflammatory); no special treatment is required.

## **5: Fire-fighting measures**

### **5.1 Unsuitable extinguishing media**

Mild irritants: No special contraindications, avoid using fire extinguishing agents that are incompatible with the substance (such as using alkali when encountering acid); Aquatic hazardous substances: Avoid using fire extinguishing agents that pollute water bodies (such as phosphorus-containing foam)

### **5.2 Specific hazards during fire fighting**

The risk of combustion is low, mostly small local fires that are not easy to spread; some substances release slightly irritating gases (such as acetic acid) when burned, which have little impact on health; if the wastewater from fire extinguishing of aquatic hazardous substances enters the water body, it may harm aquatic life.

### **5.3 Hazardous combustion products**

Carbon dioxide, water vapor, slightly irritating gases (such as sulfur dioxide, acetic acid vapor).

## **5.4 Specific extinguishing methods**

For small areas: use dry powder/water to extinguish the fire (if compatible), and use wet cleaning for dust (to prevent dust); for large areas: use foam/water to extinguish the fire, and collect the fire extinguishing wastewater at the same time (to prevent water pollution); after extinguishing the fire, ventilate to dilute the residual gas.

## **5.5 Special protective equipment for fire-fighters**

Wear anti-static work clothes, nitrile gloves, and goggles; wear a dust mask when working with dust; no special heavy equipment is required, and maintain good ventilation during operation.

# **6: Accidental release measures**

## **6.1 Protective measures for workers**

Wear chemical protective clothing (resistant to corresponding chemicals), chemical protective gloves, and goggles; wear a gas mask (organic vapor filter cartridge) for volatile substances; avoid skin contact.

## **6.2 Environmental protection measure**

Set up waterproof cofferdams to prevent leaks from entering rivers/farmland; use oil-absorbing cotton/adsorbents to intercept leaks that have already entered the water body; take samples from contaminated water bodies for testing and assess the ecological impact.

## **6.3 Containment methods for leaked chemicals**

Collect liquids in water-resistant containers (to prevent rain); collect solids in chemical-resistant bags (to prevent rain erosion); and store them in rain-proof and seepage-proof areas after collection.

## **6.4 Cleanup methods for chemical spills**

Small leakage: absorb with aquatic protective adsorption materials; large leakage: transfer to storage tank with corrosion-resistant pump; cleaning water is collected and treated, and direct discharge is prohibited.

## **6.5 Measures to prevent the spread of leaks**

Designate a 10-meter isolation zone and monitor the drainage outlet; add a rain shelter on rainy days; and set up monitoring points in downstream water bodies.

## **6.6 Container leakage treatment**

Minor leaks: seal with waterproof sealant; serious leaks: move to a rainproof area, have professionals handle it, and reuse the container after passing inspection.

## **6.7 Special considerations**

Do not discharge leaked materials/cleaning water directly into water bodies; use phosphorus-free detergents; report the leak to the environmental protection department after treatment.

## 7: Handling and storage

### 7.1 Safe storage conditions

Store in a normally ventilated warehouse (natural ventilation or mechanical ventilation, air changes ? 2 times/hour); the container should be ordinary plastic or glass (such as polyethylene bottles, glass bottles) with a sealed lid; the warehouse floor should be ordinary cement with no special anti-corrosion requirements; equipped with basic fire-fighting equipment (such as fire extinguishers, fire sand).

### 7.2 Storage precautions

Store materials by category (e.g. liquids and solids separated) to avoid confusion; clearly mark the substance name and H code on container labels; check containers for damage monthly and clean up minor leaks immediately; eating and drinking are prohibited in the warehouse, and hands must be washed after work.

### 7.3 VCI Storage Grade

Level 4 (lowest): Metal containers do not require additional VCI protection and can be stored normally. The humidity in the warehouse is ?70%, which prevents slight rust on ordinary metals without affecting their use. For long-term storage (over 6 months), the dust on the surface of the container needs to be wiped off.

### 7.4 Recommended storage temperature

10-35?, store at room temperature; avoid extreme temperatures (below -5? or above 40?); deliquescent substances (such as certain salts) should be stored in a dry place with a desiccant (such as silica gel) and replaced regularly (if the label has a recommended storage temperature, follow the label).

### 7.5 Handling

For precautions see Safety Data Sheet section 2

Advice on safe handling : Work under hood. Do not inhale substance/mixture.

## 8: Exposure controls/personal protection

### 8.1 Respiratory protection

When exposed to slightly irritating dust (such as talcum powder) or vapor (such as acetic acid), wear an ordinary dust mask; a respirator is not necessary when ventilation is good.

### 8.2 Recommended Filter type

For dust, choose Type P1 filter cotton; for slight organic vapor, choose Type A1 filter cartridge; no composite filtration is required, basic protection is sufficient.

### 8.3 Eye/face protection

Wear ordinary impact-resistant goggles with resin lenses. Wear protective glasses when handling liquids to avoid splashing.

### 8.4 Skin and body protection

Wear ordinary work clothes (cotton or chemical fiber) and wear a waterproof apron when handling liquids to prevent clothes from getting wet.

## 8.5 Hand protection

Wear nitrile or latex gloves with a thickness of  $\geq 0.2$ mm and replace them promptly after use to avoid damage.

## 8.6 Hygiene measures

Wash your hands with soap and running water after work. If your skin becomes red or itchy, apply moisturizer. Do not rub your eyes with your hands. Wash your clothes normally; no special disinfection requirements are required.

# 9: Physical and chemical properties and safety characteristics

<b>Physical state</b>	white flakes
<b>Colour</b>	Leaflets from alcohol
<b>Odour</b>	no data available
<b>Melting point/freezing point</b>	207°C(lit.)
<b>Boiling point or initial boiling point and boiling range</b>	193°C(lit.)
<b>Flammability</b>	no data available
<b>Lower and upper explosion limit/flammability limit</b>	no data available
<b>Flash point</b>	76°C(lit.)
<b>Auto-ignition temperature</b>	no data available
<b>Decomposition temperature</b>	Hazardous decomposition products formed under fire conditions - Carbon oxides.
<b>pH</b>	no data available
<b>Kinematic viscosity</b>	no data available
<b>Solubility</b>	In water:insoluble
<b>Partition coefficient n-octanol/water</b>	log Kow = 4.18
<b>Vapour pressure</b>	10 mm Hg at 146°C
<b>Density and/or relative density</b>	1.203
<b>Relative vapour density</b>	no data available

Particle characteristics      no data available

## 10: Stability and reactivity

### 10.1 Reactivity

no data available

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

This compound is not very flammable but any fire involving this compound may produce dangerous vapors. Vigorous reactions, sometimes amounting to explosions, can result from the contact between aromatic hydrocarbons, such as FLUORENE, and strong oxidizing agents. They can react exothermically with bases and with diazo compounds. Substitution at the benzene nucleus occurs by halogenation (acid catalyst), nitration, sulfonation, and the Friedel-Crafts reaction.

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

Incompatible materials: Strong oxidizing agents.

### 10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions - Carbon oxides.

## 11: Toxicological information

### 11.1 Acute toxicity

Oral: no data available

Inhalation: no data available

Dermal: no data available

### 11.2 Skin corrosion/irritation

no data available

### 11.3 Serious eye damage/irritation

no data available

### 11.4 Respiratory or skin sensitization

no data available

### **11.5 Germ cell mutagenicity**

no data available

### **11.6 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.

### **11.7 Reproductive toxicity**

no data available

### **11.8 STOT-single exposure**

no data available

### **11.9 STOT-repeated exposure**

no data available

### **11.10 Aspiration hazard**

no data available

## **12: Ecological information**

### **12.1 Toxicity**

Toxicity to fish: LC50; Species: *Lepomis macrochirus* (Bluegill) weight 0.8 g; Conditions: freshwater, static, 22°C, pH 7.5, hardness 280 mg/L CaCO<sub>3</sub>; Concentration: 760 ug/L for 96 hr (95% confidence interval: 590-970 ug/L) /98% purity

Toxicity to daphnia and other aquatic invertebrates: EC50; Species: *Daphnia magna* (Water Flea) 1st instar larva; Conditions: freshwater, static, 17°C, pH 7.5, hardness 280 mg/L CaCO<sub>3</sub>; Concentration: 430 ug/L for 48 hr (95% confidence interval: 330-550 ug/L); Effect: intoxication, immobilization /98% purity

Toxicity to algae: EC50; Species: *Pseudokirchneriella subcapitata* (Green Algae); Conditions: freshwater, static; Concentration: 3400 ug/L for 96 hr; Effect: general population changes, decreased population /98.6% purity

Toxicity to microorganisms: no data available

### **12.2 Persistence and degradability**

AEROBIC: In microbial degradation studies conducted in sandy material, fluorene and other polyaromatic hydrocarbons degraded to an average of 80%(1); in sterile controls, fluorene did not degrade suggesting microbial activity as the route of degradation(1). A review of environmental fate for fluorene has reported a fluorene biotransformation rate constant of 0.0062-0.01/hr(2); this corresponds to a half-life of 2.9-4.6 days(SRC). In a 7 day static incubation study using a sewage seed (followed by three weekly subculture inoculations for a total of 28 days of incubation), 65-82% of initial fluorene (5 and 10 ppm) was degraded after 7 days and 45-77% (of total additions) was degraded after 28 days(3); fluorene was classified as significantly degraded with gradual microbial adaptation(3). In biodegradation screening studies using subsurface soil from a contaminated creosote site, >92% of initial fluorene degraded within 1 week of incubation(4); in autoclaved soil, the degradation rate fell to 3.4% per week(4); using soil from a pristine

site, the degradation rate was not statistically different between autoclaved and non-autoclaved soil suggesting that microbial adaptation to fluorene is important in subsurface regions(4).

### **12.3 Bioaccumulative potential**

A log BCF of 3.17 (1479) was measured in the fathead minnow (*Pimephales promelas*) which were exposed over 28 days in a flow-through system(1). Log BCFs of 3.02-3.35 (1047-2238) were measured in guppies (*Poecilia reticulata*) exposed in 2-4 day periods under static and semi-static test conditions(2). A log BCF of 3.15 (1412) was measured in mosquitofish (*Gambusia affinis*) exposed over a 33 day exposure using an aquatic ecosystem(3). According to a classification scheme(4), these BCF values suggest the potential for bioconcentration in aquatic organisms is very high(SRC), provided the compound is not metabolized by the organism(SRC). Bioconcentration studies on compounds which are structurally similar suggest that bioconcentration may be lower than that indicated by the regression-derived equations due to the ability of aquatic organisms to readily metabolize this class of compounds(5).

### **12.4 Mobility in soil**

Log Koc values of 3.70 to 4.21 (5011 to 16,218) have been measured for fluorene using aquifer materials and humic materials occurring in natural water and soil(1-3). According to a classification scheme(4), these Koc values suggest that fluorene is expected to be immobile in soil. Log Koc values of 6.52 and 6.45 were reported using sediment from Lake Ketelmeer, The Netherlands(5). In an adsorption study using an estuarine water, 12% of added fluorene was adsorbed by particulate matter in water (organic matter, bacteria, clay particles, etc) over a 3-hour period which indicates that adsorption in natural estuarine water is an important environmental fate process(6).

### **12.5 Other adverse effects**

no data available

## **13: Disposal considerations**

### **13.1 Disposal methods for waste chemicals**

It can be disposed of as ordinary industrial waste or recycled by a qualified unit. Liquid substances can be neutralized to a neutral pH before discharge (subject to compliance with local environmental protection standards). Solid substances can be safely landfilled or incinerated. After cleaning, the container can be recycled as ordinary waste.

### **13.2 Precautions**

Before disposal, the characteristics of the substance must be confirmed to avoid misjudging the risk level. Mildly irritating substances must be strictly separated from food-grade waste. The disposal process must comply with local environmental regulations. Small amounts of residue can be rinsed with water, and the rinse water must be treated. Records of the amount and destination of disposal must be kept for at least three years.

## **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: 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

# 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
Fluorene	Fluorene	86-73-7	201-695-5
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Australian Inventory of Industrial Chemicals (AIIC)			Not Listed.
Catalogue of Strictly Restricted Toxic Chemicals in China			Not Listed.
China Catalog of Hazardous chemicals 2015			Not Listed.
European INventory of Existing Commercial chemical Substances			Not Listed.
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans			Listed.
TSCA Inventory of Chemical Substances			Listed.

## 16: Other information

### Information on revision

**SDS Creation Date** July 1, 2025

**SDS Revision Date** July 1, 2025

### Abbreviations and acronyms in SDS

- 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%

### SDS 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/>

**Any questions regarding this Safety Data Sheet, Please send your inquiry to [sales@MolBest.com](mailto:sales@MolBest.com)**

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