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## Material Safety Data Sheet

### 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

#### 1.1 Product identifiers

Product name                      Ferrocene  
Product number                  E060107  
Brand                                3ASenrise  
CAS number                        102-54-5

#### 1.2 Details of the supplier of the safety data sheet

Company: Anhui Senrise Technology Co., Ltd.  
Address: No.88 Weisan Road, High-Tech Industrial Development Zone, Anqing, Anhui  
Post code: 246003  
Tel: 400-005-6266  
Fax: 0556-5555368  
Email: service@3asenrise.com

#### 1.3 Emergency telephone

Emergency telephone: 0556-5500208

#### 1.4 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: For R&D use only. Not for pharmaceutical, household or other uses.

### 2 HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance or mixture

Flammable solids (Category 1), H228  
Acute toxicity, Oral (Category 4), H302  
Acute toxicity, Inhalation (Category 4), H332  
Reproductive toxicity (Category 1B), H360  
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Liver, H373  
Short-term (acute) aquatic hazard (Category 2), H401  
Long-term (chronic) aquatic hazard (Category 1), H410

#### 2.2 GHS label elements, including precautionary statements

##### Pictogram



**Signal word: Danger**

##### Hazard statement(s)

H228 Flammable solid.  
H302+H332 Harmful if swallowed or if inhaled.

H360 May damage fertility or the unborn child.

H373 May cause damage to organs through prolonged or repeated exposure.

H401 Toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

### **Precautionary statement(s)**

#### **Prevention**

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ventilating/lighting/equipment.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P264 Wash hands thoroughly after handling.

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

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

#### **Response**

P301+P312+P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.

P304+P340+P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Call a POISON CENTER/ doctor if you feel unwell.

P308+P313 IF exposed or concerned: Get medical advice/attention.

P370+P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

P391 Collect spillage. Hazardous to the aquatic environment

#### **Storage**

P405 Store locked up.

#### **Disposal**

P501 Dispose of contents/ container to an approved waste disposal plant.

### **2.3 Physical and chemical hazards**

H228 Flammable solid.

### **2.4 Health hazards**

H302 Harmful if swallowed.

H332 Harmful if inhaled.

H360 May damage fertility or the unborn child.

H373 May cause damage to organs through prolonged or repeated exposure.

### **2.5 Environmental hazards Code**

H401 Toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

### **2.6 Other hazards**

No data available

## **3 COMPOSITION/INFORMATION ON INGREDIENTS**

### **Substance / Mixture: Substance**

#### **3.1 Substance**

Name	Ferrocene
Formula	C <sub>10</sub> H <sub>10</sub> Fe
Molecular Weight	186.04
CAS	102-54-5

Concentration

98%

## **4 FIRST AID MEASURES**

### **4.1 Description of first aid measures**

#### **General advice**

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

#### **If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

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

Wash off with soap and plenty of water. Consult a physician.

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

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

#### **If swallowed**

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

No data available.

## **5 FIREFIGHTING MEASURES**

### **5.1 Extinguishing media**

Water Foam Carbon dioxide (CO<sub>2</sub>) Dry powder

### **5.2 Special hazards arising from the substance or mixture**

Carbon oxides Iron oxides Combustible. Development of hazardous combustion gases or vapours possible in the event of fire.

### **5.3 Advice for firefighters**

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 breathing vapours, mist or gas. Ensure adequate ventilation.

### **6.2 Environmental precautions**

Do not let product enter drains.

### **6.3 Methods and materials for containment and cleaning up**

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.

### **6.4 Reference to other section**

For disposal see section 13.

## **7 HANDLING AND STORAGE**

### **7.1 Precautions for safe handling**

#### **Advice on safe handling**

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

#### **Advice on protection against fire and explosion**

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

#### **Hygiene measures**

Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

## 7.2 Conditions for safe storage, including any incompatibilities

### Storage conditions

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Long term storage: RT

## 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

No data available.

### 8.2 Personal protective equipment

#### Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses.

#### Skin protection

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.

#### Body protection

Flame retardant antistatic protective clothing.

#### Respiratory protection

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

#### Control of environmental exposure

Do not let product enter drains. Risk of explosion.

## 9 PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

a) Appearance	Light yellow to yellow to orange to dark brown solid
b) Odor	No data available
c) pH	No data available
d) Melting point/freezing point	172 - 174 ° C - lit.
e) Initial boiling point and boiling range	249 ° C - lit.
f) Upper/lower flammability or explosive limits	No data available
g) Flash point	No data available
h) Evaporation rate	No data available
i) Vapor pressure	< 0.1 hPa at 40 ° C
j) Vapor density	No data available
k) Density	1.49 g/cm <sup>3</sup> at 20 ° C
l) Water solubility	0.0001 g/l at 20 ° C - slightly soluble
m) Partition coefficient: n-octanol/water	No data available
n) Autoignition temperature	No data available
o) Decomposition temperature	No data available
p) Flammability	The substance or mixture is a flammable solid.

## 10 STABILITY AND REACTIVITY

### 10.1 Chemical stability

No data available.

### 10.2 Conditions to avoid

No data available.

### 10.3 Incompatible materials

No data available

#### **10.4 Hazardous decomposition products**

In the event of fire: see section 5.

### **11 TOXICOLOGICAL INFORMATION**

#### **11.1 Acute toxicity**

LD50 Oral

- Rat - 1,320 mg/kg

LC50 Inhalation

Harmful by inhalation.

LD50 Dermal

- Rat - > 3,000 mg/kg

#### **11.2 Skin corrosion/irritation**

Skin - Rabbit Result: No skin irritation - 4 h

#### **11.3 Serious eye damage/eye irritation**

Eyes - Rabbit Result: No eye irritation - 72 h

#### **11.4 Respiratory or skin sensitization**

Maximization Test - Guinea pig Result: Does not cause skin sensitization.

#### **11.5 Germ cell mutagenicity**

Test Type: gene mutation test Test system: mouse lymphoma cells Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 476 Result: negative Test Type: Micronucleus test Species: Mouse Method: Regulation (EC) No. 440/2008,

#### **11.6 Carcinogenicity**

No data available

#### **11.7 Reproductive toxicity**

May damage the unborn child. May damage fertility.

#### **11.8 Specific target organ toxicity - single exposure**

No data available

#### **11.9 Specific target organ toxicity - repeated exposure**

Inhalation - May cause damage to organs through prolonged or repeated exposure. - Liver

#### **11.10 Aspiration hazard**

no data available.

#### **11.11 Additional Information**

RTECS: LK0700000 To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

### **12 ECOLOGICAL INFORMATION**

#### **12.1 Toxicity**

Toxicity to fish:

NOEC - Leuciscus idus (Golden orfe) - 20 mg/l - 48 h

Toxicity to daphnia and other aquatic:

EC50 - Daphnia magna (Water flea) - 1.17 mg/l - 48 h

Toxicity to algae:

static test EC50 - Desmodesmus subspicatus (green algae) - 1.03 mg/l - 72 h

Toxicity to bacteria:

static test NOEC - Pseudomonas putida - > 87.6 mg/l - 6 h

#### **12.2 Persistence and degradability**

Biodegradability aerobic - Exposure time 41 d Result: 73 % - Inherently biodegradable.

#### **12.3 Bioaccumulative potential**

No bioaccumulation is to be expected ( $\log Pow \leq 4$ ).

#### **12.4 Mobility in soil**

No data available

#### **12.5 Other adverse effects**

No data available

### **13 DISPOSAL CONSIDERATIONS**

#### **13.1 Waste treatment methods**

##### **Product**

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Observe all federal, state and local regulations when disposing of the substance.

##### **Contaminated packaging**

Disposal must be made according to official regulations.

### **14 TRANSPORT INFORMATION**

#### **14.1 UN number**

ADR/RID: 1325 IMDG: 1325 IATA: 1325

#### **14.2 UN proper shipping name**

ADR/RID: FLAMMABLESOLID, ORGAN IC, N. O. S. (Ferrocene)

IMDG: FLAMMABLESOLID, ORGAN IC, N. O. S. (Ferrocene)

IATA-DGR: Flammable solid, organic, n. o. s. (Ferrocene)

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

ADR/RID: 4.1 IMDG: 4.1 IATA: 4.1

#### **14.4 Packaging group**

ADR/RID: II IMDG: II IATA: II

#### **14.5 Environmental hazards**

ADR/RID: yes IMDG Marine pollutant: yes IATA: no

#### **14.6 Special precautions for user**

No data available

### **15. REGULATORY INFORMATION**

#### **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

Applicable regulations

Please pay attention to waste disposal and meet the requirements of local regulations.

### **16. OTHER INFORMATION**

#### **Abbreviations and acronyms**

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

IMDG: International Maritime Dangerous Goods

IATA: International Air Transport Association

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

CAS: Chemical Abstracts Service (division of the American Chemical Society)

#### **Further information**

The above safety technical information is for reference only, because many physical and chemical properties are not entirely clear. Please consult information carefully before use and use after confirmation.

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