

# SAFETY DATA SHEET

## ISR-CI



Revision date: 2019-06-11  
Version 1.0

### 1. PRODUCT AND COMPANY IDENTIFICATION

#### Product Identifier

Product Name: ISR-CI

Synonyms: Ferrous sulfide / Iron sulfide / Iron sulphide / Iron(II) sulfide / Ferrous sulfide / Iron sulfide / Iron sulphide / Iron(II) sulfide

#### Other means of identification

CAS No: 1317-37-9

Formula: FeS

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

Recommended Use: Remediation of contaminated groundwater and soils

Restrictions on Use: Use as recommended by the label

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

Supplier Tersus Environmental, LLC  
1116 Colonial Club Rd  
Wake Forest, NC 27587  
Phone: +1-919-453-5577  
Email: [info@tersusenv.com](mailto:info@tersusenv.com)

Contact Person David F. Alden  
Phone: +1-919-453-5577 x2002  
Email: [david.alden@tersusenv.com](mailto:david.alden@tersusenv.com)

#### Emergency telephone number

For leak, fire, spill or accident emergencies, call:

+1-919-453-5577 (Tersus Office Hours, 8:00 AM to 5:00 PM Eastern)  
+1-800-424-9300 (Chemtrec 24 Hour Service – Emergency Only)  
+1-703-527-3887 (Chemtrec Outside United States 24 Hour Service – Emergency Only)  
+1-919-638-7892 Gary M. Birk (Outside office hours)

### 2. HAZARD IDENTIFICATION

#### Classification

GHS-US classification		
Skin corrosion/irritation	Category 2	H315
Serious eye damage/eye irritation	Category 2A	H319

Full text of H statements: see Section 16

**GHS Label elements, including precautionary statements****Label elements**

## Hazard Pictograms

**Signal word** Warning**Hazard statement** H315 - Causes skin irritation  
H319 - Causes serious eye irritation**Precautionary statement**

P264 - Wash hands thoroughly after handling  
P280 - Wear eye protection, protective clothing, protective gloves  
P302+P352 - If on skin: Wash with plenty of water  
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes.  
Remove contact  
lenses, if present and easy to do. Continue rinsing  
P321 - Specific treatment (see Consult a doctor/medical service if you feel unwell  
on this label)  
P332+P313 - If skin irritation occurs: Get medical advice/attention  
P337+P313 - If eye irritation persists: Get medical advice/attention  
P362+P364 - Take off contaminated clothing and wash it before reuse

**Hazard(s) not otherwise classified (HNOC)****HMIS Classification:**

Health hazard: 0  
Flammability: 0  
Physical hazards: 0

**NFPA Rating:**

Health hazard: 1  
Fire: 0  
Reactivity Hazard: 0

**Inhalation**

May be harmful if inhaled. May cause respiratory tract irritation.

**Skin**

May be harmful if absorbed through skin. May cause skin irritation.

**Eyes**

May cause eye irritation.

**Ingestion**

May be harmful if swallowed.

**Other Hazards not contributing to the classification**

Generates toxic gas in contact with acid.

**Supplemental information** None.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Chemical Name	CAS Number	Concentration (wt. %)	GHS-US classification
Iron sulfide (FeS)	1317-37-9	7 -11	Not classified
Sodium Sulfide	1313-82-2	0.1 - 1	Acute Tox. 3 (Oral), H301

Occupational exposure limits, if available, are listed in Section 8.  
Full text of hazard classes and H-statements: see Section 16.

**4. FIRST AID MEASURES**

General	Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
Eye Contact	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a doctor/physician. If eye irritation persists: Get medical advice/attention.
Skin Contact	Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention.
Inhalation	Remove person to fresh air and keep comfortable for breathing. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician.
Ingestion	Rinse mouth. Do NOT induce vomiting. Immediately call a poison center or doctor/physician. Call a poison center/doctor/physician if you feel unwell.
Most important symptoms and effects, both acute and delayed	<ul style="list-style-type: none"> <li>• Symptoms/injuries: Causes skin and eye irritation.</li> <li>• Symptoms/injuries after skin contact: Irritation.</li> <li>• Symptoms/injuries after eye contact: Causes serious eye damage. Eye irritation.</li> </ul>
Indication of immediate medical attention and special treatment needed, if necessary	Treat symptomatically.

**5. FIRE-FIGHTING MEASURES**

<b>Suitable Extinguishing Media</b>	Foam. Dry powder. Carbon dioxide. Water spray. Sand.
<b>Unsuitable extinguishing media</b>	Do not use a heavy water stream.
<b>Specific Hazards Arising from the Chemical</b>	Reactivity: Corrosive vapors.
<b>Firefighting instructions</b>	Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.

**Protective equipment and precautions for firefighters**

Do not enter fire area without proper protective equipment, including respiratory protection. Do not attempt to act without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions**

Ventilate spillage area. Evacuate unnecessary personnel. Avoid contact with skin and eyes. Do not attempt to act without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to Section 8: "Exposure controls/personal protection".

**Environmental Precautions**

Avoid release to the environment. Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

**Methods for Containment**

Dike to collect large liquid spills. Stop leak and contain spill if this can be done safely. Small spillage: Dilute with large quantities of water.

**Methods for cleaning up**

Take up liquid spill into absorbent material. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials. Dispose of materials or solid residues at an authorized site.

## 7. HANDLING AND STORAGE

**Precautions for Safe Handling****Handling**

Ensure good ventilation of the workstation. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. Do not breathe dust, fume, gas, mist, spray, vapors. Avoid contact during pregnancy/while nursing. Avoid contact with skin and eyes. Wear personal protective equipment.

**Hygiene**

Wash hands thoroughly after handling. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

**Conditions for Safe Storage, Including Any Incompatibilities****Technical Measures  
Storage Conditions**

Comply with applicable regulations. Keep only in the original container in a cool, well ventilated place away from: Ignition sources, Incompatible materials. Keep container closed when not in use. Store in a well-ventilated place. Keep cool.

**Incompatible Products  
Incompatible Materials**

Strong bases. Strong acids.  
Sources of ignition. Direct sunlight.

## 8. EXPOSURE CONTROL / PERSONAL PROTECTION

**Control parameters**

Exposure guidelines, ingredients with workplace control parameters.

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
ISR-CL 1317-37-9	TWA: 1.4 mg/m <sup>3</sup> TWA: 1 ppm STEL: 7 mg/m <sup>3</sup> STEL: 5 ppm	No information available	No information available
Iron sulfide (FeS) (1317-37-9)	No information available		
Sodium sulfide (1313-82-2)	No information available		

**Appropriate engineering controls**

**Appropriate engineering controls** Ensure good ventilation of the workstation. Provide eyewash station.

**Individual protection measures, such as personal protective equipment**

**Eye/face protection** Wear safety glasses with side shields (or goggles) and a face shield.  
**Skin Protection (Hands)** Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.  
**Skin Protection (Other)** Wear suitable protective clothing.  
**Respiratory protection** In case of insufficient ventilation, wear suitable respiratory equipment.  
**General hygiene considerations** Keep from contact with clothing and other combustible materials. Remove and wash contaminated clothing promptly. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Do not eat, drink or smoke during use.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

Appearance	Black liquid with visible suspended solids.
Physical State	Liquid
Color	Black
Odor	Rotten eggs
Odor threshold	No information available
pH	11.5 to 12.8
Melting point/freezing point	Not applicable
Boiling Point/Range	No information available
Flash point	No information available
Evaporation Rate	No information available
Flammability (solid, gas)	Non flammable
Flammability Limit in Air	No information available
Upper flammability limit:	No information available
Lower flammability limit:	No information available
Vapor pressure	No information available
Vapor density	No information available
Specific gravity	1.15 to 1.22
Water solubility	Minimally soluble in water.
Solubility in other solvents	No information available
Partition coefficient log Kow	No information available

Autoignition temperature	No information available
Decomposition temperature	No information available
Viscosity, kinematic	No information available
Viscosity, dynamic	No information available
Explosive properties	No information available
Oxidizing properties	No information available

## 10. STABILITY AND REACTIVITY

<b>Reactivity</b>	Acidic vapors.
<b>Chemical stability</b>	Not established.
<b>Possibility of hazardous reactions</b>	Contact with acids liberates toxic gas.
<b>Conditions to avoid</b>	Direct sunlight. Extremely high or low temperatures.
<b>Incompatible materials</b>	Acids will cause the release of highly toxic Hydrogen Sulfide. Reacts violently with diazonium salts. Ferrous sulfide(s) solution is not compatible with copper, zinc, aluminum or their alloys (i.e. bronze, brass, galvanized metals, etc.). Corrosive to steel above 150° F (65.5° C). These materials of construction should not be used in handling systems or storage containers for this product.
<b>Hazardous decomposition products</b>	Hazardous decomposition products formed under fire may include sulfur oxides, iron oxides.

## 11. TOXICOLOGICAL INFORMATION

### Sodium Sulfide (113-82-2)

LD50 oral rat	208 mg/kg
ATE US (oral)	208 mg/kg body weight
LD50 dermal rabbit	< 340 mg/kg
ATE US (dermal)	300.000 mg/kg body weight

### Information on toxicological effects

<b>Acute toxicity</b>	Not classified
<b>Skin corrosion/irritation</b>	Causes skin irritation. pH: 11.5 - 12.8
<b>Serious eye damage/eye irritation</b>	Causes eye irritation. pH: 11.5 - 12.8
<b>Respiratory sensitization</b>	Not classified
<b>Skin sensitization</b>	Not classified
<b>Germ cell mutagenicity</b>	Not classified
<b>Carcinogenicity</b>	Not classified
<b>Reproductive toxicity</b>	Not classified
<b>Specific target organ toxicity - single exposure</b>	Not classified.
<b>Specific target organ toxicity - repeated exposure</b>	Not classified.
<b>Aspiration hazard</b>	Not classified
<b>Chronic effects</b>	Not classified
<b>Potential Adverse human health effects and symptoms</b>	Based on available data, the classification criteria are not met.
<b>Symptoms/injuries after skin contact</b>	Irritation.

**Symptoms/injuries after eye contact** Causes eye irritation.

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity Effects

Ecology - general: The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

Active Ingredient	Duration	Species	Value	Units
ISR-CI (1317-37-9)	LC50	Mosquito fish	>10,000	mg/L
Sodium Sulfide (1313-82-2)	96 h LC50	Poecilia reticulata	7.7 - 29.1	mg/L
Sodium Sulfide (1313-82-2)	48 h EC50	Daphnia magna	2.1	mg/L

### Persistence and Degradability

Not established.

### Bioaccumulation

FerroBlack-FS27 (1317-37-9): Bioaccumulative potential not established.

Sodium Sulfide (16721-80-5): Log Pow, -3.5 (at 25 °C)

### Mobility

No additional information available

### Other Adverse Effects

- **Effect on the global warming:** No known effects from this product.
- **GWPmix comment:** No known effects from this product.
- **Other information:** Avoid release to the environment.

## 13. DISPOSAL CONSIDERATIONS

Waste treatment methods	Dispose of contents/container in accordance with licensed collector's sorting instructions.
Waste disposal recommendations	Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.
Ecology - waste materials	Avoid release to the environment.

## 14. TRANSPORTATION INFORMATION

### **U.S. (D.O.T.)**

Proper Shipping Name:	Chemicals not otherwise indexed (NOI) nonhazardous.
Hazard Class:	Not applicable
UN/NA:	Not applicable
Labels:	Not applicable

### **Canada (T.D.G.)**

Proper Shipping Name:	Chemicals not otherwise indexed (NOI) nonhazardous.
Hazard Class:	Not applicable
UN/NA:	Not applicable

Labels Not applicable

**IMDG**

Proper Shipping Name: Chemicals not otherwise indexed (NOI) nonhazardous.  
Hazard Class: Not applicable  
UN/NA: Not applicable  
Labels: Not applicable

**IATA**

Proper Shipping Name: Chemicals not otherwise indexed (NOI) nonhazardous.  
Hazard Class: Not applicable  
UN/NA: Not applicable  
Labels: Not applicable

**15. REGULATORY INFORMATION****U.S. Federal Regulations****Iron sulfide (FeS) (1317-37-9)**

Listed on the United States TSCA (Toxic Substances Control Act) inventory

**Sodium Sulfide (1313-82-2)**

Listed on the United States TSCA (Toxic Substances Control Act) inventory

**International regulations****Canada****Iron sulfide (FeS) (1317-37-9)**

Listed on the Canadian DSL (Domestic Substances List)  
WHMIS Classification Uncontrolled product according to WHMIS classification criteria

**Sodium Sulfide (1313-82-2)**

Listed on the Canadian DSL (Domestic Substances List)

**EU-Regulations****Iron sulfide (FeS) (1317-37-9)**

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

**Sodium Sulfide (1313-82-2)**

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

**National regulations****Iron sulfide (FeS) (1317-37-9)**

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

**Sodium Sulfide (1313-82-2)**

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Listed on INSQ (Mexican National Inventory of Chemical Substances)



**US State Regulations****Sodium Sulfide (1313-82-2)**

U.S. - Massachusetts - Right to Know List

U.S. - New Jersey - Right to Know Hazardous Substance List

**16. OTHER INFORMATION****Full text of H-phrases:**

H301 Toxic if swallowed

H315 Causes skin irritation

H319 Causes serious eye irritation

H400 Very toxic to aquatic life

**Disclaimer:** This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. All recommendations for the use of our products, whether given by us, orally or to be implied from data or lab tests results by us, are based on the current state of our knowledge at the time those recommendations are made. When additional information is obtained, these recommendations may be updated. They may also be influenced by circumstances outside our control. Notwithstanding, such recommendation the user is responsible that the product as supplied by us is suitable to the process or purpose he intends to use it. The user of the product is solely responsible for compliance with all laws and regulations applying to the use of this product. Since we cannot control the application, use or processing of the product, we do not accept responsibility. Therefore, the user should assure that the intended use of the product will not infringe in any party's intellectual property right.

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**End of Safety Data Sheet**