

SAFETY DATA SHEET

ISR-CI



Creation Date: 10/1/2018
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Version 1.1
SDS # 28A

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 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

Product form: Mixture

1.2 Other means of identification

CAS No: 1317-37-9

Formula: FeS

1.3 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

1.4 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

1.5 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)

2. HAZARD IDENTIFICATION

2.1 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.

2.2 GHS Label elements, including precautionary statements

2.2.1 Label elements

Hazard Pictograms



GHS07

2.3 Signal word

Warning!

2.4 Hazard statement

H315 - Causes skin irritation

H319 - Causes serious eye irritation

2.5 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

2.6 Hazard(s) not otherwise classified (HNOC)**2.6.1 HMIS Classification:**

Health hazard: 0

Flammability: 0

Physical hazards: 0

2.6.2 NFPA Rating:

Health hazard: 1

Fire: 0

Reactivity Hazard: 0

2.6.3 Inhalation

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

2.6.4 Skin

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

2.6.5 Eyes

May cause eye irritation.

2.6.6 Ingestion

May be harmful if swallowed.

2.6.7 Other Hazards not contributing to the classification

Generates toxic gas in contact with acid.

2.7 Supplemental information N/A**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Chemical Name	CAS Number	Concentration (wt. %)	GHS-US classification
Iron sulfide (FeS)	1317-37-9	7 -11	N/A
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**4.1 General**

Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

4.1.1 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.

4.1.2 Skin Contact

Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention.

4.1.3 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.

4.1.4 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.

4.2 Important symptoms and effects (acute and delayed)

- Symptoms/injuries: Causes skin and eye irritation.
- Symptoms/injuries after skin contact: Irritation.
- Symptoms/injuries after eye contact: Causes serious eye damage. Eye irritation.

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

Treat symptomatically.

5. FIRE-FIGHTING MEASURES**5.1 Suitable Extinguishing Media**

Foam. Dry powder. Carbon dioxide. Water spray. Sand.

5.2 Unsuitable extinguishing media

Do not use a heavy water stream.

5.3 Specific Hazards Arising from the Chemical

Reactivity: Corrosive vapors.

5.4 Firefighting instructions Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.

5.5 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

6.1 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".

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

6.3 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.

6.4 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

7.1 Precautions for Safe Handling

7.1.1 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.

7.1.2 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.

7.2 Conditions for Safe Storage, Including Incompatibilities

7.2.1 Technical Measures Comply with applicable regulations.

7.2.2 Storage Conditions 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.

7.2.3 Incompatible Products Strong bases. Strong acids.

7.2.4 Incompatible Materials Sources of ignition. Direct sunlight.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 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 ³ TWA: 1 ppm STEL: 7 mg/m ³ 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		

8.2 Appropriate engineering controls

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

8.3 Individual protection measures, such as personal protective equipment

8.3.1 Eye/face protection Wear safety glasses with side shields (or goggles) and a face shield.

8.3.2 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.

8.3.3 Skin Protection (Other) Wear suitable protective clothing.

8.3.4 Respiratory protection Try to ensure good ventilation as previously stated. However, if this is not possible, in case of insufficient ventilation, wear suitable respiratory equipment.

8.3.5 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

9.1 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

10.1 Reactivity

Acidic vapors.

10.2 Chemical stability

Not established.

10.3 Possibility of hazardous reactions

Contact with acids liberates toxic gas.

10.4 Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5 Incompatible materials

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.

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire may include sulfur oxides, iron oxides.

11. TOXICOLOGICAL INFORMATION

11.1 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

11.2 Information on toxicological effects

11.2.1 Acute toxicity

Not classified

11.2.2 Skin corrosion/irritation	Causes skin irritation. pH: 11.5 - 12.8
11.2.3 Serious eye damage/eye irritation	Causes eye irritation. pH: 11.5 - 12.8
11.2.4 Respiratory sensitization	Not classified
11.2.5 Skin sensitization	Not classified
11.2.6 Germ cell mutagenicity	Not classified
11.2.7 Carcinogenicity	Not classified
11.2.8 Reproductive toxicity	Not classified
11.2.9 Specific target organ toxicity (Single exposure)	Not classified.
11.2.10 Specific target organ toxicity (Repeated exposure)	Not classified.
11.2.11 Aspiration hazard	Not classified
11.2.12 Chronic effects	Not classified
11.2.13 Potential Adverse human health effects and symptoms	Based on available data, the classification criteria are not met.
11.2.14 Symptoms/injuries after skin contact	Irritation.
11.2.15 Symptoms/injuries after eye contact	Causes eye irritation.

12. ECOLOGICAL INFORMATION

12.1 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

12.2 Persistence and Degradability

Not established.

12.3 Bioaccumulation

ISR-CI (1317-37-9): Bioaccumulative potential not established.
Sodium Sulfide (16721-80-5): Log Pow, -3.5 (at 25°C)

12.4 Mobility

No additional information available

12.5 Other Adverse Effects

12.5.1 Effect on the global warming: No known effects from this product.

12.5.2 GWPmix comment: No known effects from this product.

12.5.3 Other information: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

- | | |
|---|---|
| <u>13.1 Waste treatment methods</u> | Dispose of contents/container in accordance with licensed collector's sorting instructions. |
| <u>13.2 Waste disposal recommendations</u> | Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation. |
| <u>13.3 Ecology - waste materials</u> | Do not release out into the environment. |

14. TRANSPORTATION INFORMATION

14.1 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

14.2 Canada (T.D.G.)

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

14.3 IMDG

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

14.4 IATA

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

15. REGULATORY INFORMATION

15.1 U.S. Federal Regulations

15.1.1 Iron sulfide (FeS) (1317-37-9)

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

15.1.2 Sodium Sulfide (1313-82-2)

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

15.2 International regulations

15.2.1 Canada

15.2.1.1 Iron sulfide (FeS) (1317-37-9)

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

15.2.1.2 Sodium Sulfide (1313-82-2)

Listed on the Canadian DSL (Domestic Substances List)

15.2.2 EU-Regulations

15.2.2.1 Iron sulfide (FeS) (1317-37-9)

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

15.2.2.2 Sodium Sulfide (1313-82-2)

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

15.3 National regulations

15.3.1 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)

15.3.2 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)
Listed on CICR (Turkish Inventory and Control of Chemicals)

15.4 US State Regulations

15.4.1 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

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End of Safety Data Sheet