Rocky Mountain Reagents
SCIENTIFIC SOLUTIONS SINCE 1951

SDS

Safety Data Sheet

1. IDENTIFICATION

Product Identifier: **Ferrous Sulfate, 0.1 Normal**

Product Code(s): F1004

Synonyms: Iron (II) Sulfate Solution; Green Vitriol Solution

Recommended Use: For manufacturing, industrial, and laboratory use only. Use as a laboratory reagent.

Uses Advised Against: Not for food, drug, or household use.

Supplier:
Rocky Mountain Reagents, Inc.
4621 Technology Drive, Golden, CO 80403
Phone: (303) 762-0800 Fax: (303) 762-1240

Emergency Phone Number: (800) 255-3924 (VelocityEHS)

2. HAZARDS IDENTIFICATION

Hazard Classifications:

Acute Toxicity – Inhalation:	Category 4
Skin Corrosion/Irritation:	Category 1A
Eye Damage/Irritation:	Category 1

Signal Word: DANGER

Hazard Statements:
Harmful if inhaled.
Causes severe skin burns and serious eye damage.

Pictograms:



Precautionary Statements:

Prevention:
Do not breathe fumes, mists, vapors, or spray.
Use only outdoors or in a well-ventilated area.
Wash thoroughly after handling.
Wear protective gloves, protective clothing, eye protection, and face protection.

Response: Immediately call a poison center or doctor.

If inhaled: Remove person to fresh air and keep comfortable for breathing.
If swallowed: Rinse mouth. Do NOT induce vomiting.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Wash contaminated clothing before reuse.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage: Store locked up.

Disposal: Dispose of contents and container in accordance with local, regional, national, and international regulations.

Hazards Not Otherwise Classified: Toxic to aquatic life. Avoid release to the environment.
Inhalation of inorganic mists containing sulfuric acid may cause cancer.

Toxicity Statement: Not applicable.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Component	Common Name / Synonyms	CAS#	Chemical Formula	% by Weight
Water	Water	7732-18-5	H_2O	92.4
Ferrous Sulfate, Heptahydrate	Iron(II) Sulfate, Heptahydrate	7782-63-0	$FeSO_4 \cdot 7H_2O$	2.60
Sulfuric Acid	Hydrogen Sulfate, Oil of Vitriol	7664-93-9	H_2SO_4	5.02

Trade Secret Statement: Not applicable.

4. FIRST AID MEASURES

First Aid Procedures:

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious, or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediately call a poison center or doctor.

Ingestion: Rinse mouth. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, keep head low so that vomit does not enter lungs. Never give anything by mouth to an unconscious person. Immediate medical attention is required. Call a physician or poison control center immediately.

Skin Contact: Wash skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Immediately call a poison center or doctor.

Eye Contact: Check for and remove contact lenses, if present and easy to do. Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Immediate medical attention is required. Call a physician immediately.

General Advice: Poison information centers in each state can provide additional assistance for scheduled poisons. Ensure that those providing first aid and medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Symptoms and Effects: Irritation, burning, ulceration, coughing, sneezing, choking sensation, hoarseness, dyspnea, bronchitis, gastric infection, nausea, vomiting, diarrhea, thirst, difficulty swallowing,

	salivation, chills, fever, shock, weak and rapid pulse. Corrosive. Harmful if swallowed, inhaled, or absorbed through the skin. Causes damage to the eyes, skin, respiratory tract, and gastrointestinal tract. May enter lungs if swallowed or vomited.
Immediate Medical Care/ Special Treatment:	Immediate medical attention is required. Get medical attention immediately if feeling unwell or concerned. Treat symptomatically.

5. FIREFIGHTING MEASURES

Suitable Extinguishing Media:	Water spray, dry powder, alcohol resistant foam, carbon dioxide.
Unsuitable Extinguishing Media:	Do not use a solid (straight) water stream, as it may scatter and spread fire.
Hazardous Combustion Products:	Hydrogen, sulfur oxides, iron oxides.
Specific Hazards:	Contact with metals may yield hydrogen gas. Excessive thermal conditions may yield corrosive and/or toxic fumes. Contact with water may cause exothermic reaction.
Special Protective Equipment/ Precautions for Firefighters:	As in any fire, wear MSHA/NIOSH-approved (or equivalent), self-contained, positive-pressure or pressure-demand breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions and Protective Equipment:	Ventilate area of leak or spill. Isolate hazard area and keep unnecessary and unprotected personnel away from the area of the leak or spill. Keep upwind. Wear appropriate personal protective equipment (see Section 8). Avoid contact with eyes, skin, and clothing.
Emergency Procedures:	In case of chemical emergency, or if unsure how to address an accidental release, consult a professional (see Section 1).
Methods for Containment:	Stop the flow of material if this is without risk. Prevent entry into waterways, sewer, basements, or confined areas. Dike the spilled material, where this is possible. Product should not be released to the environment. Contain and recover liquid when possible.
Methods for Cleanup:	Absorb spill with an inert material (e.g., vermiculite, dry sand, earth, cloth, or fleece) and place in a non-combustible container for reclamation or disposal. Do not flush to sewer. Clean contaminated surface thoroughly. Residues from spills can be diluted with water. Never return spills in original containers for reuse. Clean up in accordance with all applicable regulations.

7. HANDLING AND STORAGE

Handling:	Wear personal protective equipment (see Section 8). Use only in well-ventilated areas. Provide sufficient air exchange and/or exhaust in work rooms. Avoid contact with skin, eyes, and clothing. Do not breathe vapors or spray mist. Do not ingest. When using, do not eat, drink, or smoke. Limit exposure to light. Keep away from incompatible materials (see Section 10). Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly after handling. Containers of this material may be hazardous when empty, as they retain product residues. Observe all warnings and precautions listed for this product. As with all acids, never add water directly to this product. Instead, add product to water to prevent violent eruption of the solution.
Storage:	Store in a cool, dry, ventilated area. Store in a segregated and approved area away from heat and incompatible materials (see Section 10). Store in original container. Do not store in metallic containers. Keep out of light. Keep containers tightly closed and upright. Keep away

from food, drink, and animal foodstuffs. Keep out of the reach of children. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of this product.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

Water:	No information found.	
Ferrous Sulfate, Heptahydrate:	ACGIH (TLV):	1 mg/m^3
	NIOSH (TWA):	1 mg/m^3
Sulfuric Acid:	OSHA (PEL):	1 mg/m^3
	ACGIH (TLV):	0.2 mg/m^3

Engineering Controls: Ensure adequate ventilation. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Measures:

Eye/Face Protection: Wear safety glasses with side shields or goggles. Wear a face shield. Maintain approved eye wash station and accessible rinse facilities in work area.

Skin Protection: Wear appropriate chemical resistant clothing (with long sleeves) and appropriate chemical resistant gloves.

Respiratory Protection: An air-purifying, NIOSH-approved respirator with appropriate cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Use a full-face, positive-pressure, air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are unknown, or if any other circumstances exist where air-purifying respirators may not provide adequate protection.

Specific Requirements for Personal Protective Equipment: Ensure that glove material is compatible with this product. This information is available from glove manufacturers.

9. PHYSICAL AND CHEMICAL PROPERTIES

Unless otherwise indicated, all properties are given at 25 °C and standard pressure.

Appearance: Light blue, transparent liquid.

Odor: Very slight.

Odor Threshold: No information found.

Formula Weight: 278.01 as ferrous sulfate, heptahydrate

pH: < 1

Melting/Freezing Point: No information found.

Boiling Point/Range: No information found.

Decomposition Temperature: No information found.

Flash Point: Not applicable.

Auto-ignition Temperature: Not applicable.

Flammability: Not flammable.

Flammability/Explosive Limits:	Not applicable.
Solubility:	Miscible with water.
Vapor Pressure:	No information found.
Vapor Density (Relative):	No information found.
Specific Gravity:	1.07 (Water = 1)
Evaporation Rate:	No information found.
Viscosity:	No information found.
Partition Coefficient (n-octanol/water):	No information found.

10. STABILITY AND REACTIVITY

Reactivity Data: Corrosive. See Section 11.

Chemical Stability: Stable under normal conditions. Sensitive to light.

Conditions to Avoid: Excessive heat, light, incompatible materials.

Incompatible Materials: Strong oxidizers, strong bases, strong acids, organic compounds, combustible materials, metals, water.

Hazardous Decomposition Products: Hydrogen, sulfur oxides, iron oxides.

Possibility of Hazardous Reactions: May react vigorously or violently with the incompatible materials listed above. Contact with metals may produce hazardous concentrations of hydrogen gas. Excess thermal conditions may yield hazardous decomposition products listed above. Contact with water or strong bases may cause violent exothermic reaction.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Exposure: Inhalation, ingestion, skin contact, eye contact.

Acute Effects: Corrosive. Harmful if swallowed, inhaled, or absorbed through the skin. Causes damage to the eyes, skin, respiratory tract, and gastrointestinal tract. May enter lungs if swallowed or vomited.

Chronic Effects: Prolonged or repeated exposure may affect the liver, respiratory system, kidneys, and central nervous system; may cause tooth decay, dermatitis, conjunctivitis, reproductive effects, mutagenic effects, and cancer.

Toxicological Data:

Water:	Not applicable.	
Ferrous Sulfate, Heptahydrate:	LD_{50} Oral, Rat:	3250 mg/kg
Sulfuric Acid:	LD_{50} Oral, Rat:	2140 mg/kg
	LC_{50} Inhalation, Rat:	0.510 mg/L, 2 h
	Corrosive to skin and eyes based on animal data.	

Symptoms of Exposure: Irritation, burning, blurred vision, ulceration, coughing, sneezing, choking sensation, hoarseness, dyspnea, bronchitis, gastric infection, nausea, vomiting, diarrhea, abdominal pain, thirst, difficulty swallowing, salivation, chills, fever, shock, weak and rapid pulse.

Carcinogenic Effects: This product may cause cancer.

ACGIH: Sulfuric Acid: A2 – Suspected human carcinogen

IARC: Sulfuric Acid: 1 – Carcinogenic to humans

12. ECOLOGICAL INFORMATION

Ecotoxicological Data: Water:

Not applicable.

Ferrous Sulfate, Heptahydrate:

EC_{50}, Water Flea (Daphnia magna):	6.15 – 9.26 mg/L, 48 h
LC_{50}, Carp (Cyprinus carpio):	0.56 mg/L, 96 h

Sulfuric Acid:

LC_{50}, Western Mosquitofish (Gambusia affinis):	42 mg/L, 96 h
EC_{50}, Water Flea (Daphnia magna):	29 mg/L, 24 h

Persistence and Degradability: No information found.

Environmental Effects: Toxic to aquatic organisms. May leach into groundwater. Avoid release to the environment.

13. DISPOSAL INFORMATION

Disposal Instructions: Dispose of this material and its container to hazardous or special waste collection point. Minimize exposure to product waste (see Section 8). Do not dispose unused waste down drains or into sewers. All wastes must be handled in accordance with local, state, and federal regulations.

Contaminated Packaging: Because emptied containers retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.

Waste Codes: D002: Waste Corrosive Material (pH ≤ 2 or pH ≥12.5 or corrosive to steel)

14. TRANSPORT INFORMATION

DOT:

UN Number: UN3264

Proper Shipping Name: Corrosive liquid, acidic, inorganic, n.o.s. (Sulfuric acid)

Hazard Class: 8

Packing Group: II

ERG Number: 154

Environmental Hazard Regulations: No information found.

Other Transport Precautions: No information found.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

OSHA: This product is considered a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Inventory: All components of this product are on the U.S. TSCA Inventory.

U.S. EPCRA (SARA Title III):

Section 302: Sulfuric Acid: Reportable Quantity: 1000 lb
Threshold Planning Quantity: 1000 lb

Sections 311/312:

Hazard Category	List (Yes/No)
Section 311 – Hazardous Chemical	Yes
Immediate Hazard	Yes
Delayed Hazard	Yes
Fire Hazard	No
Pressure Hazard	No
Reactivity Hazard	Yes

Section 313: Component: Sulfuric Acid
De Minimis Concentration: 1.0 %

CERCLA Reportable Quantities: Sulfuric Acid: 100 lb
Ferrous Sulfate, Heptahydrate: 1000 lb

International Inventories:

Country or Region	Inventory Name	On Inventory (Yes/No)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes

*A "Yes" indicates that the listed component(s) of this product comply with the inventory requirements administered by the governing country or region.

16. OTHER INFORMATION

Disclaimer: Rocky Mountain Reagents, Inc. provides the information in this Safety Data Sheet in the belief that it is reliable but assumes no responsibility for its completeness or accuracy. The physical properties reported in this SDS are obtained from literature and do not constitute product specifications. Rocky Mountain Reagents, Inc. makes and gives no representations or warranties with respect to the information contained herein or the product to which it refers, whether express, implied, or statutory, including without limitation, warranties of accuracy, completeness, merchantability, non-infringement, performance, safety, suitability, stability, and fitness for a particular purpose. No warranty against infringement of any patent, copyright or trademark is made or implied. This SDS is intended only as a guide to the appropriate handling of the material by a properly trained person. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. Accordingly, Rocky Mountain Reagents, Inc. assumes no liability whatsoever for the use of or reliance upon this information including results obtained, incidental or consequential damages, or lost profits.

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