

FERROUS SULPHATE

GHS Safety Data Sheet

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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

FERROUS SULFATE

OTHER NAMES

Fe-S-O-4.7H₂O, Fe-S-O-4.7H₂O, Fe-S-O11-H14, Fe-S-O11-H14, "iron (II) sulphate, heptahydrate iron (II) sulfate, heptahydrate", "iron (II) sulphate, heptahydrate iron (II) sulfate, heptahydrate", "green vitriol", "iron vitriol", copperas, ironate, mol -iron, feosol, "iron (II) sulphate (1:1), heptahydrate", "iron (II) sulphate (1:1), heptahydrate", "iron (II) sulfate (1:1), heptahydrate", "iron (II) sulfate (1:1), heptahydrate", "sulphate of iron", "iron sulphate", "iron sulfate", APS, AR00000226, TECH00005406, TECH00000595, UL00002424

PRODUCT USE

In manufacture of iron compounds, in electroplating baths, aluminium etching, process engraving and lithography, in redox polymerisation .
 In fertiliser, as food and feed supplement; in radiation dosimeters,
 As reducing agent in chemical processes, in leather dyes and writing inks.
 Component of weed killer, wood preservative, water treatment processes.
 In prevention of chlorosis in plants. Used therapeutically as hematinic and in veterinary medicine, to combat iron deficiency and as an astringent.

SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

315- 317, T.V. INDUSTRIAL ESTATE,

248, WORLI,

MUMBAI- 400030.INDIA.

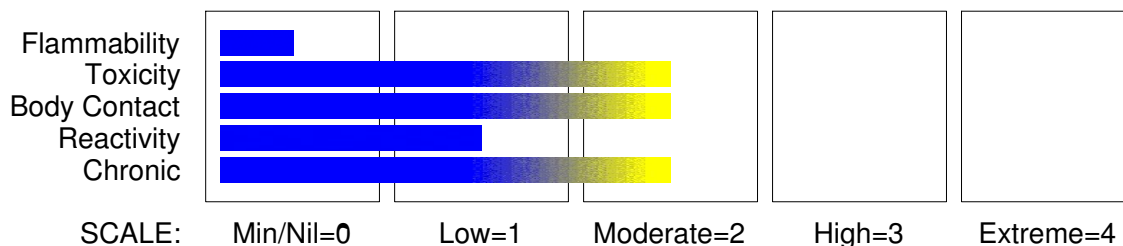
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HAZARD RATINGS



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Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Oral) Category 4

Eye Irritation Category 2A

Skin Corrosion/Irritation Category 2



EMERGENCY OVERVIEW

HAZARD

WARNING

Determined using GHS criteria:

H302 H315 H319

Harmful if swallowed

Causes skin irritation

Causes serious eye irritation

PRECAUTIONARY STATEMENTS

Prevention

Wash hands thoroughly after handling.

Wash thoroughly after handling.

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

Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists, get medical advice/attention.

Wear eye/face protection.

If skin irritation occurs, seek medical advice/attention.

IF ON SKIN: Gently wash with plenty of soap and water.

Specific treatment: refer to Label or MSDS.

Remove/Take off immediately all contaminated clothing

Wash/Decontaminate removed clothing before reuse.

Storage

Store locked up.

Disposal

Dispose of contents and container in accordance with relevant legislation.

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Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
ferrous sulfate heptahydrate	7782-63-0	> 98

Section 4 - FIRST AID MEASURES

SWALLOWED

- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
 - For advice, contact a Poisons Information Centre or a doctor.
- Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:
- Induce vomiting with fingers down the back of the of the throat, ONLY IF CONSCIOUS.
 - Lean patient forward or place on left side (head-down position if possible) to maintain open airway and prevent aspiration.
- NOTE: Wear a protective glove when inducing vomiting by mechanical means.
- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
 - If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided. Further action will be the responsibility of the medical specialist.
 - If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.

EYE

- If this product comes in contact with the eyes:
- Wash out immediately with fresh running water.
 - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
 - If pain persists or recurs seek medical attention.
 - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

- If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear.
 - Flush skin and hair with running water (and soap if available).
 - Seek medical attention in event of irritation.

INHALED

- If dust is inhaled, remove from contaminated area.
- Encourage patient to blow nose to ensure clear passage of breathing.
- If irritation or discomfort persists seek medical attention.

NOTES TO PHYSICIAN

For acute or short term repeated exposures to iron and its derivatives:

- Always treat symptoms rather than history.
 - In general, however, toxic doses exceed 20 mg/kg of ingested material (as elemental iron) with lethal doses exceeding 180 mg/kg.
 - Control of iron stores depend on variation in absorption rather than excretion.
- Absorption occurs through aspiration, ingestion and burned skin.
- Hepatic damage may progress to failure with hypoproteinaemia and hypoglycaemia.

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Section 4 - FIRST AID MEASURES

Hepatorenal syndrome may occur.

- Iron intoxication may also result in decreased cardiac output and increased cardiac pooling which subsequently produces hypotension.
 - Serum iron should be analysed in symptomatic patients. Serum iron levels (2-4 hrs post -ingestion) greater than 100 ug/dL indicate poisoning with levels, in excess of 350 ug/dL, being potentially serious. Emesis or lavage (for obtunded patients with no gag reflex) are the usual means of decontamination.
 - Activated charcoal does not effectively bind iron.
 - Catharsis (using sodium sulfate or magnesium sulfate) may only be used if the patient already has diarrhoea.
 - Deferoxamine is a specific chelator of ferric (3+) iron and is currently the antidote of choice. It should be administered parenterally. [Ellenhorn and Barceloux: Medical Toxicology].
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Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- There is no restriction on the type of extinguisher which may be used.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.
- Prevent by any means available spillage/runoff from entering drains or water courses.
- Use fire fighting procedures suitable for surrounding area.
- Cool fire exposed material with water spray.
- If safe to do so, remove material from path of fire.

FIRE/EXPLOSION HAZARD

Non combustible.

Not considered to be a significant fire risk.

Decomposes on heating and produces toxic fumes of sulfur oxides (SO_x).

FIRE INCOMPATIBILITY

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Personal Protective Equipment

Gloves, boots (chemical resistant).

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Wear impervious gloves and safety glasses.
- Use dry clean up procedures and avoid generating dust.
- Sweep up or
- Vacuum up (consider explosion-proof machines designed to be grounded during storage and use).

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Section 6 - ACCIDENTAL RELEASE MEASURES

- Place spilled material in clean, dry, sealable, labelled container.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

ferrous sulfate heptahydrate 350 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

ferrous sulfate heptahydrate 12.5 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:

ferrous sulfate heptahydrate 7.5 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:

ferrous sulfate heptahydrate 2.5 mg/m³

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+: May be stored together

O: May be stored together with specific precautions

X: Must not be stored together

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- When handling DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling.
- Avoid physical damage to containers.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

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Section 7 - HANDLING AND STORAGE

SUITABLE CONTAINER

DO NOT use unlined steel containers.

Multi-ply paper bag with sealed plastic liner or heavy gauge plastic bag.

NOTE: Bags should be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse. Check that all containers are clearly labelled and free from leaks. Packing as recommended by manufacturer.

Glass container or Plastic container.

Polylined drum.

STORAGE INCOMPATIBILITY

Avoid reaction with oxidising agents.

Avoid strong bases.

Avoid storage with soluble carbonates.

STORAGE REQUIREMENTS

- Keep dry.
- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials.
- Protect containers against physical damage.
- Check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- ferrous sulfate heptahydrate:

CAS:7782- 63- 0 CAS:7720- 78- 7

MATERIAL DATA

The recommended TLV is thought to reduce the likelihood of respiratory irritation and skin irritation from exposure to aerosols and mists of soluble iron salts.

PERSONAL PROTECTION



EYE

- Safety glasses with side shields; or as required,
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

- Barrier cream and Rubber Gloves or PVC gloves.
- Safety footwear.

OTHER

- Overalls.
- Eyewash unit.

RESPIRATOR

Protection Factor	Half- Face Respirator	Full- Face Respirator	Powered Air Respirator
10 x ES	P1 Air- line*	- -	PAPR- P1 -
50 x ES	Air- line**	P2	PAPR- P2
100 x ES	-	P3	-
		Air- line*	-
100+ x ES	-	Air- line**	PAPR- P3

* - Negative pressure demand ** - Continuous flow.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult

your

Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

Use in a well-ventilated area.

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:

solvent, vapours, degreasing etc., evaporating from tank (in still air)

aerosols, fumes from pouring operations,

intermittent container filling, low speed

conveyer transfers, welding, spray drift,

plating acid fumes, pickling (released at low velocity into zone of active generation)

direct spray, spray painting in shallow booths,

drum filling, conveyer loading, crusher dusts,

gas discharge (active generation into zone of rapid air motion)

grinding, abrasive blasting, tumbling, high

speed wheel generated dusts (released at high

Air Speed:

0.25- 0.5 m/s (50- 100 f/min)

0.5- 1 m/s (100- 200 f/min.)

1- 2.5 m/s (200- 500 f/min)

2.5- 10 m/s (500- 2000 f/min.)

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

initial velocity into zone of very high rapid air motion).

Within each range the appropriate value depends on:

Lower end of the range

1: Room air currents minimal or favourable to capture

2: Contaminants of low toxicity or of nuisance value only

3: Intermittent, low production.

4: Large hood or large air mass in motion

Upper end of the range

1: Disturbing room air currents

2: Contaminants of high toxicity

3: High production, heavy use

4: Small hood - local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Pale, bluish green odourless crystals or granules. Efflorescent in dry air; oxidises in moist air to brown coloured basic ferric sulfate. Available as Technical, Pure and BP grades. Soluble in water (approx. 16 g/l cold water); practically insoluble in alcohol. It is acidic and a reducing agent.

PHYSICAL PROPERTIES

Solid.

Mixes with water.

Molecular Weight: 278.01

Melting Range (°C): 65 (loses water)

Solubility in water (g/L): Miscible

pH (1% solution): 3.7 (10 % sol)

Volatile Component (%vol): Not applicable.

Relative Vapour Density (air=1): Not applicable

Lower Explosive Limit (%): Not applicable.

Autoignition Temp (°C): Not applicable.

State: Divided solid

Boiling Range (°C): 300 (- 7 H₂O)

Specific Gravity (water=1): 1.90

pH (as supplied): Not applicable

Vapour Pressure (kPa): Not applicable

Evaporation Rate: Not applicable

Flash Point (°C): Not applicable

Upper Explosive Limit (%): Not applicable.

Decomposition Temp (°C): > 300

Viscosity: Not available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.

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Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

- Product is considered stable.
 - Hazardous polymerisation will not occur.
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Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

EYE

Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals.

Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

SKIN

Evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.

Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions.

INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

CHRONIC HEALTH EFFECTS

Principal routes of exposure are by accidental skin and eye contact and inhalation of generated dusts.

Chronic excessive iron intakes have been associated with haemosiderosis and consequent possible damage to the liver and pancreas.

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Section 11 - TOXICOLOGICAL INFORMATION

High levels of iron may raise the risk of cancer. This concern stems from the theory that iron causes oxidative damage to tissues and organs by generating highly reactive chemicals, called free radicals, which subsequently react with DNA. Cells may be disrupted and may become cancerous. People whose genetic disposition prevents them from keeping tight control over iron (e.g. those with the inherited disorder, haemochromatosis) may be at increased risk.

Iron overload in men may lead to diabetes, arthritis, liver cancer, heart irregularities and problems with other organs as iron builds up.

[K. Schmidt, New Scientist, No. 1919 pp.11-12, 2nd April, 1994].

As with any chemical product, contact with unprotected bare skin; inhalation of vapour, mist or dust in work place atmosphere; or ingestion in any form, should be avoided by observing good occupational work practice.

TOXICITY AND IRRITATION

TOXICITY

Oral (rat) LDLo: 1389 mg/kg

IRRITATION

Nil Reported

Section 12 - ECOLOGICAL INFORMATION

No data for ferrous sulfate heptahydrate.

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM: None

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:UN, IATA, IMDG

Section 15 - REGULATORY INFORMATION

REGULATIONS

ferrous sulfate heptahydrate (CAS: 7782-63-0) is found on the following regulatory lists;
International Council of Chemical Associations (ICCA) - High Production Volume List
OECD Representative List of High Production Volume (HPV) Chemicals
United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances - Table II

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Section 16 - OTHER INFORMATION

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

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