FERROUS SULPHATE HEPTAHYDRATE
Safety Data Sheet- MSDS

Update version -IV-

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifiers

Product name	:	**Ferrous Sulphate Heptahydrate**
CAS-No.	:	7782-63-0

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

Identified uses	:	Fertilizer, Laboratory chemicals, Industrial & for professional use only.

OTHER NAMES - In manufacture of iron compounds, in electroplating baths, aluminum etching, process engraving and lithography, in redox polymerization. In fertilizer, 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

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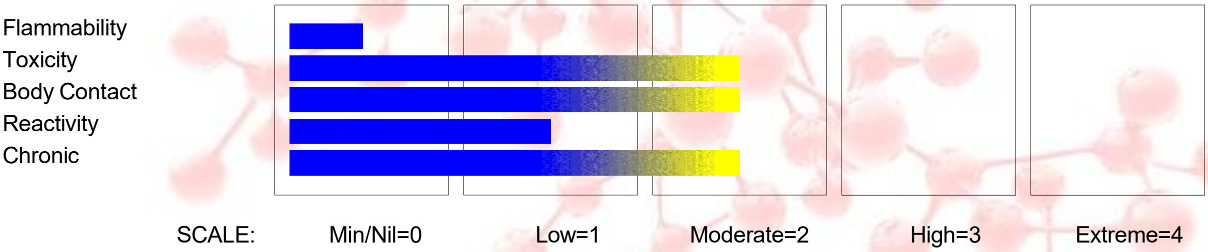
HAZARD RATINGS



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.

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 meantime, 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 hypoprothrombinemia and hypoglycemia 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 analyzed in symptomatic patients. Serum iron levels (2-4 hrs post-ingestion) greater that 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 diarrhea. Deferoxamine is a specific chelator of ferric (3+) iron and is currently the antidote of choice. It should be administered parenterally. [Ellen horn and Barce Loux: Medical Toxicology].

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 firefighting 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

Noncombustible.
Not considered to be a significant fire risk.
Decomposes on heating and produces toxic fumes of sulfur oxides (Sox).

FIRE INCOMPATIBILITY

Avoid contamination with oxidizing agents i.e. nitrates, oxidizing 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).

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/m^3

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

\+ X + X + 0

+: May be stored together
O: May be stored together with specific preventions 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.

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

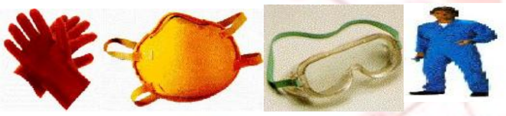
The following materials had no OELs on our records

- 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 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:	Air Speed:
solvent, vapours, degreasing etc., evaporating f/min) from tank (in still air)	0.25- 0.5 m/s (50- 100
aerosols, fumes from pouring operations, f/min.) intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5- 1 m/s (100- 200
direct spray, spray painting in shallow booths, f/min) drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500
grinding, abrasive blasting, tumbling, high f/min.) speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favorable to	1: Disturbing room air currents capture
2: Contaminants of low toxicity or of nuisance	2: Contaminants of high toxicity value only
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	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 odorless crystals or granules. Efflorescent in dry air; oxidizes in moist air to brown colored 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)
applicable Volatile Component (%vol): Not applicable.
Relative Vapour Density (air=1): Not applicable
Lower Explosive Limit (%): Not applicable.
applicable. Autoignition Temp (°C): Not applicable.
State: Divided solid

Boiling Range (°C): 300 (- 7 H_2O)
Specific Gravity (water=1): 1.90
pH (as supplied): Not applicable
Vapour Pressure (kPa): Not
Evaporation Rate: Not applicable
Flash Point (°C): Not applicable
Upper Explosive Limit (%): Not
Decomposition Temp (°C): > 300
Viscosity: Not available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials. Product is considered stable.
- Hazardous polymerization will not occur

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 characterized 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 characterized 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 hemosiderosis and consequent possible damage to the liver and pancreas.

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 be 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 vapor, 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	IRRITATION
Oral (rat) LDLo: 1389 mg/kg	Nil Reported

Section 12 – ECPLOGICAL INFORMATION

No data for ferrous sulfate heptahydrate.

Section 13 - DISPOSAL INFORMATION

- 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 - TRANSPORT INFORMATION

HAZCHEM: None
NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: UN, IATA, IMDG

Section 15 - REGULATORY INFORMATION

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

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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