JORENKU Fe. Min

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SAFETY DATA SHEET

Safety data sheet according to (EF) no. 1907/2006.

POINT 1: Identification of material/compounds and of the company/factory

1.1. Product identifier:
Fe. Min

1.2. Relevant identifying use of the material or compound and the usage that is contraindicated:
Vitamin- and mineral supplement for feed.

1.3. Detailed information about the supplier for the safety data sheet:
Jorenku A/S
Teglvaerksvej 11
4733 Tappernoeje
Denmark
Tel.: +45 56214070

Responsible for safety data sheet (e-mail): jorenku@jorenku.dk

1.4. Emergency phone:
Contact the poison centre in your own country.

POINT 2: Identification of danger

2.1. Classification of the material or compound:
Environmentally hazardous liquid
CLP (1272/2008): Aquatic Chronic 3;H412

2.2. Label elements:

H412:	Harmful to aquatic life with long lasting effects.
P273:	Avoid release to the environment.

2.3. Other dangers:
PBT/vPvB: The ingredients are not PBT/vPvB according to the criteria in REACH annex XIII.
Endocrine disrupting properties: The ingredients are not considered endocrine disruptors according to the criteria of Regulation 2017/2100 or Regulation 2018/605.

POINT 3: Compensation of/information about contents

3.1. Compensation of/information about contents
3.2. Compounds:

Substance name	CAS	EF-No.	Index-no.	REACH reg.no.	Substance Classification	Note
Ferrous lactate	5905-52-2	227-608-0	-	-	-	1
Citric acid	77-92-9	201-069-1	607-750-00-3	01-2119457026-42	Eye Irrit. 2;H319 STOT SE 3;H335	-

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Substance name	CAS	EF-No.	Index-no.	REACH reg.no.	Substance Classification	Note
Propionic acid	79-09-4	201-176-3	607-089-00-0	01-2119486971-24	Flam. Liq. 3;H226 Skin Corr. 1B;H314 Eye Dam. 1;H318 STOT SE 3;H335	1,2
Hydrogen peroxide	7722-84-1	231-765-0	008-003-00-9	01-2119485845-22	Ox. Liq. 1;H271 Acute Tox. 4;H302+H332 Skin Corr. 1A;H314 Eye Dam. 1;H318 STOT SE 3;H335	1,3,4
Zinc oxide	1314-13-2	215-222-5	030-013-00-7	01-2119463881-32	Aquatic Acute 1;H400 (M=1) Aquatic Chronic 1;H410 (M=1)	1
Copper sulphate pentahydrate	7758-99-8	231-847-6	029-023-00-4	01-2119520566-40	Acute Tox. 4;H302 Eye Dam. 1;H318 Aquatic Acute 1;H400 (M=10) Aquatic Chronic 1;H410 (M=1)	1,5

1) The substance is an organic solvent.
2) SCL (Specific Concentration limits) for classification: Skin Corr. 1B;H314: C ≥ 25%; Skin Irrit. 2;H315: 10% ≤ C < 25%; Eye Irrit. 2;H319: 10% ≤ C < 25%; STOT SE 3;H335: C ≥ 10% (Harmonised classification)
3) ATE (inhalation, vapour) = 11 mg/l; ATE (indtagelse) = 1026 mg/kg
4) SCL (Specific Concentration limits) for classification (harmonised classification): Ox. Liq. 1;H271: C > 70%; Skin Corr. 1A;H314: C > 70%; Ox. Liq. 2;H272: 50% < C < 70%; Skin Corr. 1B;H314: 50% < C < 70%; STOT SE 3;H335: C > 35%; Skin Irrit. 2;H315: 35% < C < 50%; Eye Dam. 1;H318: 8% < C < 50%; Eye Irrit. 2;H319: 5% < C < 8%
5) ATE (oral) = 482 mg/kg

The wording of the hazard statements - see paragraph 16.

POINT 4: First aid measures

4.1. Description of first aid measures:

General: Bring the person to fresh air. Keep calm under supervision. In case of discomfort: See medical attention.

Skin: Remove contaminated clothing. Rinse skin and wash thoroughly with soap and water. In case of discomfort: See medical attention.

Eyes: Immediately rinse with water or physiological saline for at least 15 minutes. If possible remove contact lenses and open the eye wide. By continued irritation: seek medical attention.

Ingestion: Immediately rinse mouth thoroughly and drink copious amounts of water. In case of discomfort: Seek medical attention.

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4.3. Indication of whether emergency medical attention and special treatment are needed:
Show this safety data sheet to doctors or casualty ward.

POINT 5: Fire suppression

5.1. Suppression methods:
Not flammable. Against surrounding fire: Water fogging (never water jet - spreads the fire), foam, powder or carbon dioxide.

5.2. Special dangers in connection with the material or compound:
Cannot burn.

5.3. Indication for a fire department:
Use compressed air mask by heavy smoke from surrounding fire.

POINT 6: Accidental release measures

6.1. Personal precautions, personal protective equipment, and emergency procedures:
Use personal protective equipment - see point 8. Limit spread. Ensure good ventilation.

6.2. Environmental protection indications:
Avoid discharge to drains - see point 12. Inform local environmental authorities in case of spillage to the environment.

6.3. Methods and equipment for containment and cleaning:
Smaller amounts are soaked up with paper or the like. Larger amounts are soaked up with granulate and collect in a plastic bucket with a close-fitting lid. Rinse thoroughly with water. Further waste handling - see point 13.

6.4. References to other points:
See above.

POINT 7: Handling and storage

7.1. Measures for safe handling:
Ensure good ventilation. Avoid contact with skin and eyes. After use, wash with plenty of water and soap. There must be access to water and eyewash bottles.

7.2. Conditions for safe storage, including any incompatibility:
Safe in well-closed original container, cool and protected from moisture.

7.3. Special usage:
See use - point 1.

PUNKT 8: Exposure control/personal protective equipment

8.1. Control parameter:
AT-limit value (reg. 1054 of 28.06.2022):

	8-hours limit value	**Short-term limit value**	**Anm.**
Iron salts, dissolvable, calculated as Fe	1 mg/m^3	2 mg/m^3	-
Propionic acid	10 ppm = 31 mg/m^3	20 ppm = 62 mg/m^3	E
Hydrogen peroxide	1 ppm = 1,4 mg/m^3	2 ppm = 2,8 mg/m^3	-
Zinc oxide and zinc oxide smoke, calculated as Zn	4 mg/m^3	8 mg/m^3	-

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	8-hours limit value	Short-term limit value	Anm.
Kobber, pulver og støv	1 mg/m³	2 mg/m³	-

E = The substance has an EF-limit value

DNEL:	Exposure	Value	Population	Effects
Propionic acid	Long-term, skin	0.26 mg/kg	Workers	Local
	Long-term, skin	20.9 mg/kg	Workers	Systemic
	Acute, inhalation	62 mg/m³	Workers	Local
	Acute, inhalation	62 mg/m³	Workers	Systemic
	Long-term, inhalation	31 mg/m³	Workers	Local
	Long-term, inhalation	73 mg/m³	Workers	Systemic
Hydrogen peroxide	Long-term, inhalation	1.4 mg/m³	Workers	Local
	Acute, inhalation	3 mg/m³	Workers	Local
	Long-term, inhalation	0.21 mg/m³	Consumers	Local
	Acute, inhalation	1.93 mg/m³	Consumers	Local
Zinc oxide	Long-term, inhalation	5 mg/m³	Workers	Systemic
	Long-term, skin	83 mg/kg/d	Workers	Systemic
	Long-term, inhalation	0.83 mg/kg/d	Consumers	Systemic
	Long-term, skin	83 mg/kg/d	Consumers	Systemic
	Long-term, inhalation	2.5 mg/m³	Consumers	Systemic

PNEC:	Medium	Value
Propionic acid	Fresh water	0.5 mg/l
	Sea water	0.05 mg/l
	Fresh water sediment	1.86 mg/kg
	Sea water sediment	0.186 mg/kg
	Sewage works (STP)	5 mg/l
	Soil	0.126 mg/kg
Copper sulphate	Fresh water	7.8 µg/l
	Sea water	5.2 µg/l
	Soil	65 mg/kg
Hydrogen peroxide	Fresh water	0.013 mg/l
	Sea water	0.013 mg/l
	Sewage works (STP)	4.66 mg/l
	Fresh water sediment	0.047 mg/kg
	Sea water sediment	0.047 mg/kg
	Sporadic discharge	0.014 mg/l
	Soil	0.003 mg/kg
Zinc oxide	Fresh water	0.0206 mg/l
	Sea water	0.0061 mg/l
	Fresh water sediment	117.8 mg/kg
	Sea water sediment	56.5 mg/kg
	Sewage works (STP)	52 µg/l
	Soil	35.6 mg/kg

8.2. Exposure control:
Appropriate measures for exposure control: Provide effective ventilation.

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Personal protective equipment:
Inhalation: By dusty work: Use approved mask (EN149) with particle filter P2. The filters have a limited service life (must be changed). Read the manufacturer's instructions.
Skin: Wear protective gloves (EN374) made of nitrile rubber. Breakthrough time 8 hours.
Eyes: Close-fitting safety glasses (EN166) by risk of eye contact.
Environmental exposure controls: Avoid discharge to the environment.

POINT 9: Physical and chemical characteristics

9.1. Information about basic physical and chemical characteristics:

Appearance:	Liquid
Colour:	Not decided
Odor:	Characteristic
Melting point/freezing point (°C):	Not decided
Boiling point or bubble-point and boiling point interval (°C):	Not decided
Ignitability (solid, gaseous):	Not decided
Upper/lower explosion limits (vol-%):	Not decided
Flash point (°C):	Not relevant
Auto-ignition temperature (°C):	Not decided
Self-accelerating decomposition temperature (°C):	Not relevant
pH:	Not decided
Kinematic viscosity (mm^2/s at 40°C):	Not decided
Solubility (mg/l):	Soluble in water
Partition coefficient n-octanol/water Log K_{ow}:	Not relevant – solution (see point 12)
Vapor pressure (hPa, 20°C):	Not decided
Density and/or relative density (g/cm^3):	Not decided
Relative vapor density (air=1):	Not decided
Particulate properties:	Not decided for liquids

9.2. Other information: None known.

POINT 10: Stability and reactivity

10.1. Reactivity:
None known.

10.2. Chemical stability:
Stable under recommended storage conditions - see point 7.

10.3. Risk of dangerous reactions:
None known.

10.4. Conditions that should be avoided:
Avoid strong heating.

10.5. Materials that should be avoided:
Oxidants, acids and bases.

10.6. Dangerous decomposition products:
None known.

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POINT 11: Toxicological information

11.1. Information about hazard classes as defined in Regulation (EC) No 1272/2008:

Acute toxicity: Based on available data, the classification criteria are not met.
Skin corrosion/irritation: Based on available data, the classification criteria are not met.
Serious eye damage/eye irritation: Based on available data, the classification criteria are not met.
Respiratory or skin sensitization: Based on available data, the classification criteria are not met.
Germ cell mutagenicity: Based on available data, the classification criteria are not met.
Carcinogenicity: Based on available data, the classification criteria are not met.
Reproduction toxicity: Based on available data, the classification criteria are not met.
Single STOT-exposure: Based on available data, the classification criteria are not met.
Repeated STOT-exposures: Based on available data, the classification criteria are not met.
Based on available data, the classification criteria are not met.
Aspiration hazard: Based on available data, the classification criteria are not met.

Danger class	Data	Test	Data source
Acute toxicity:			
Inhalation	LC_{50} (rat) > 19.7 mg/l/1H (vapour) (Propionic acid)	Not informed	ECHA
	LC_{50} (rat, vapour) = 2 mg/l/4H (Hydrogen peroxide)	Not informed	IUCLID
	LC_{50} (rat, fog) > 170 mg/m3/4H (Hydrogen peroxide)	OECD 403	ECHA
Dermal	LC_{50} (rat) > 5.7 mg/l/4h (Zinc oxide)	OECD 403	Supplier
	LC_{50} (rat) = 5800 mg/l (Citric acid)	Not informed	Supplier
	LD_{50} (rabbit) = 3235 mg/kg (Propionic acid)	Not informed	ECHA
Oral	LD_{50} (rabbit) > 1000 mg/kg (Copper sulphate)	Not informed	IUCLID
	LD_{50} (rabbit) > 2000 mg/kg (Hydrogen peroxide)	Not informed	ECHA
	LD_{50} (rat) > 2000 mg/kg (Zinc oxide)	OECD 402	Supplier
	LD_{50} (rat) > 2000 mg/kg (Citric acid)	OECD 402	Supplier
	LD_{50} (mouse) > 2000 mg/kg (Ferrous lactate)	Not informed	RTECS
	LD_{50} (rat) = 2600 mg/kg (Propionic acid)	Not informed	TOXNET
	LD_{50} (rat) = 482 mg/kg (Copper sulphate)	Not informed	Supplier
	LD_{50} (rat) = 1026 mg/kg (Hydrogen peroxide)	OECD 401	ECHA
	LD_{50} (rat) > 5000 mg/kg (Zinc oxide)	OECD 401	ECHA
	LD_{50} (rat) > 5400 mg/kg (Citric acid)	Not informed	Supplier
Corrosivity/ irritation:	Corrosive,, rabbit (Propionic acid)	OECD 404	ECHA
	Eye irritation, rabbit (Copper sulphate)	OECD 405	ECHA
	No skin irritation, rabbit (Copper sulphate)	OECD 404	ECHA
	Causes severe burns on skin and eyes, rabbit (Hydrogen peroxide)	OECD 404/405	IUCLID
	No skin- and eye irritation (Zinc oxide)	OECD 404/405	ECHA
	No skin irritation, rabbit (Citric acid)	OECD 404	Supplier
	Eye irritation, rabbit (Citric acid)	OECD 405	Supplier
Sensitisation:	No skin sensitizing, guinea pig (Propionic acid)	OECD 406	ECHA
	No skin sensitizing, guinea pig (Copper sulphate)	OECD 406	ECHA
	No skin sensitizing, guinea pig (Citric acid)	OECD 406	Supplier

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Danger class	Data	Test	Data source
CMR:	No CMR-effects (Propionic acid) No CMR-effects (Copper sulphate) No mutagenicity – negative result (Hydrogen peroxide)	Different Different Ames	ECHA ECHA IUCLID

Usual exposure methods: Lungs, skin, and gastrointestinal tract.

Inhalation: May be irritating to the mucous membranes of the respiratory tract with sore throat, cough and shortness of breath.

Skin: May be mildly irritating.

Eyes: May be irritating with redness and sting.

Ingestion: May irritate the mucous membranes in the mouth and throat and cause nausea and discomfort. If large amounts are consumed, bloody vomiting, diarrhoea, fall in blood-pressure, constipation, gastric ulcer and palpitation may occur. In the body during release of oxygen, hydrogen peroxide is split which can cause tissue damage.

Chronic effects: Frequent or long-term skin contact can degrease the skin, cause eczema, cracking, redness and itching and trigger an allergic reaction. Long-term repeated exposure to hydrogen peroxide causes a risk of bleaching of hair and skin. In tests with bacteria, hydrogen peroxide has caused changes in the hereditary genes. Animal tests show conflicting results regarding carcinogenic effect. It is possible that hydrogen peroxide not in itself is carcinogenic, but that it may magnify the carcinogenic effect of other substances.

11.2. Information about other hazards: None known.

POINT 12: Environmental information

12.1. Toxicity:

Aquatic	Data	Test (Media)	Data source
Fish	LC_{50} (Leuciscus idus, 96h) > 10,000 mg/l (Propionic acid)	Not informed	ECHA
	LC_{50} (Oncorhynchus mykiss, 96h) = 0.032 mg/l (Copper sulphate)	Not informed (FW)	EPA Ecotox
	LC_{50} (Pimephales promelas, 96h) = 16.4 mg/l (Hydrogen peroxide)	Not informed (FW)	ECHA
	LC_{50} (Leuciscus idus, 96h): 440-760 mg/l (Citric acid)	OECD 203 (FW)	IUCLID
Crustacean	EC_{50} (Daphnia magna, 48h) > 500 mg/l (Propionic acid)	Not informed	ECHA
	EC_{50} (Daphnia magna, 48h) = 0.019 mg/l (Copper sulphate)	Not informed (FW)	EPA Ecotox
	LC_{50} (Daphnia pulex, 48h) = 2.4 mg/l (Hydrogen peroxide)	Not informed (FW)	ECHA
	EC_{50} (Daphnia magna, 24h) = 1535 mg/l (Citric acid)	Not informed (FW)	ECHA
Alga	EC_{50} (Selenastrum capricornutum, 72h) = 0.17 mg/l (Zinc oxide)	OECD 201 (FW)	Supplier
	EC_{50} (Pseudokirchneriella subcapitata, 5d) = 0.003 mg/l (Copper sulphate)	Not informed (FW)	EPA Ecotox
	EC_{50} (Skeletonema costatum, 72h) = 1.38 mg/l (Hydrogen peroxide)	Not informed (SW)	ECHA
	EC_{50} (Scenedesmus quadricauda, 168h) = 425 mg/l (Citric acid)	Not informed (FW)	Supplier

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12.2. Persistence and degradability:
Most of the ingredients are inorganic substances. Methods for determining the biodegradability do not apply to inorganic substances.
Propionic acid is rapidly biodegradable, 95 % in 10 days (OECD 302B).
Citric acid s rapidly biodegradable, 100 % (OECD 301 E).

12.3. Bioaccumulative potential:
Propionic acid: Log K_{ow} = 0.3 (OECD 107) (no bioaccumulation).
Copper bioaccumulates strongly in invertebrates.
Hydrogen peroxide: Log K_{ow} = -1,57 (model data). Is not expected to bioaccumulates.
Zinc oxide: Log K_{ow} = 1,53 (no signigicant bioaccumulationg).
Citric acid: Log K_{ow} = -1.72 (no significiant bioaccumulation).
The bioconcentration factor (BCF) is for citric acid calculated to 3.2, and therefore the substans is not seen as bioaccumulating.

12.4. Mobility in soil:
Copper sulfate is easily soluble in water (forms copper and sulphate ions upon dissolution) and has great mobility in soil environments.
Hydrogen peroxide: Log K_{oc} = 1,58 (very high mobility in land treatment).
Citric acid: Log K_{oc} = -1,72 (very high mobility in land treatment is expected).

12.5. Results of PBT and vPvB assessment:
The ingredients are not PBT/vPvB according to the criteria in REACH annex XIII.

12.6. Endocrine-disrupting capacities:
None known.

12.7. Other adverse effects:
None known.

POINT 13: Removal

13.1. Methods for waste handling:
The chemical must be considered as hazardous waste. Use the local authority's collection scheme.

Chemical waste group:	**EAK-code:**
H	02 01 06

POINT 14: Transport information

Not covered by the transport regulations (ADR/RID/IMDG/IATA).
14.1. UN-number or ID-number: None.
14.2. UN-shipment designation (UN proper shipping name): None.
14.3. Transport danger class(es): None.
14.4. Packaging group: None.
14.5. Environmental dangers: None.
14.6. Special regulations for the user: None.
14.7. Bulk transport by sea according to IMO instruments: Not relevant.

POINT 15: Information about regulations

15.1. Special determinations/special rules for the material or compound with respect to safety, health and environment:
None.

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15.2. Chemical safety evaluation:
No CSR.

POINT 16: Other information

Hazard statements given under point 3:
H226: Flammable liquid and vapour.
H271: May cause fire or explosion; strong oxidiser.
H302: Harmful if swallowed.
H302+H332: Harmful if swallowed or if inhaled.
H314: Causes severe skin burns and eye damage.
H318: Causes serious eye damage.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.

Abbreviations:
AT = Working environment authority
CMR = carcinogenic, mutagenic, or toxic to reproduction
CSR = Chemical Safety Report
DNEL = Derived No-Effect Level
EC_{50} = Effect Concentration 50 %
LC_{50} = Lethal Concentration 50 %
LD_{50} = Lethal dosage 50 %
PBT = Persistent, Bioaccumulative, Toxic
PNEC = Predicted No-Effect Concentration
FW = Fresh Water
vPvB = very Persistent, very Bioaccumulative

Literature:
ECHA = REACH Registration dossier from ECHA's website
EPA Ecotox = Environmental Protection Agency
IUCLID = International Uniform ChemicaL Database Information
RTECS = Register of Toxic Effects of Chemical Substances
TOXNET = Toxicology Data Network via Toxline database

Advice on training / instruction:
The product may only be used by persons who are carefully instructed in the execution of the work and who have knowledge of the contents of this safety data sheet.

Changes since previous version:
Not relevant - first edition.

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