SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Revision Date 03.02.2015  Version 7.2

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Catalogue No. 102786
Product name Manganese(II) sulfate tetrahydrate for analysis EMSURE®
REACH Registration Number A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.
CAS-No. 10101-68-5

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

Identified uses Reagent for analysis
For additional information on uses please refer to the Merck Chemicals portal (www.merckgroup.com).

1.3 Details of the supplier of the safety data sheet

Company Merck KGaA * 64271 Darmstadt * Germany * Phone:+49 6151 72-0
Responsible Department EQ-RS * e-mail: prodsafe@merckgroup.com

1.4 Emergency telephone number

Please contact the regional company representation in your country.

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Specific target organ toxicity - repeated exposure, Category 2, H373
Chronic aquatic toxicity, Category 2, H411
For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification (67/548/EEC or 1999/45/EC)

Xn Harmful R48/20/22
N Dangerous for the environment R51/53
For the full text of the R-phrases mentioned in this Section, see Section 16.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms

Signal word Warning
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 102786
Product name Manganese(II) sulfate tetrahydrate for analysis EMSURE®

Hazard statements
H373 May cause damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements
Prevention
P273 Avoid release to the environment.
Response
P314 Get medical advice/attention if you feel unwell.

Reduced labelling (≤125 ml)

Hazard pictograms

Signal word
Warning

Index-No. 025-003-00-4

2.3 Other hazards
None known.

SECTION 3. Composition/information on ingredients

3.1 Substance
Formula MnSO₄ * 4 H₂O MnO₄S * 4 H₂O MnO₄S * 4 H₂O (Hill)
Index-No. 025-003-00-4
EC-No. 232-089-9
Molar mass 223.06 g/mol
Remarks No disclosure requirement according to Regulation (EC) No. 1907/2006.

3.2 Mixture
Not applicable

SECTION 4. First aid measures

4.1 Description of first aid measures
After inhalation: fresh air. If breathing stops: mouth-to-mouth breathing or artificial respiration. Oxygen if necessary. Immediately call in physician.

After skin contact: wash off with plenty of water. Remove contaminated clothing.

After eye contact: rinse out with plenty of water. Consult doctor in the event of any complaints.

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
Irritation and corrosion, irritant effects, gastric pain, Diarrhoea, Nausea, Vomiting

4.3 Indication of any immediate medical attention and special treatment needed
No information available.

SECTION 5. Firefighting measures

5.1 Extinguishing media
Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Not combustible.
Ambient fire may liberate hazardous vapours.
Fire may cause evolution of:
Sulphur oxides

5.3 Advice for firefighters
Special protective equipment for firefighters
In the event of fire, wear self-contained breathing apparatus.

Further information
Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid substance contact. Avoid generation of dusts; do not inhale dusts. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

6.2 Environmental precautions
Do not empty into drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills.
Observe possible material restrictions (see sections 7 and 10).
Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling
Advice on safe handling
Observe label precautions.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Dry.

Recommended storage temperature see product label.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Engineering measures
Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Individual protection measures
Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection
Safety glasses

Hand protection
full contact:
Glove material: Nitrile rubber
Glove thickness: 0,11 mm
Break through time: > 480 min

splash contact:
Glove material: Nitrile rubber
Glove thickness: 0,11 mm
Break through time: > 480 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 741 Dermatril® L (full contact), KCL 741 Dermatril® L (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Respiratory protection
required when dusts are generated.

Recommended Filter type: Filter P 2 (acc. to DIN 3181) for solid and liquid particles of harmful substances

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
Environmental exposure controls
Do not empty into drains.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>solid</td>
</tr>
<tr>
<td>Colour</td>
<td>pink</td>
</tr>
<tr>
<td>Odour</td>
<td>odourless</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>No information available.</td>
</tr>
<tr>
<td>pH</td>
<td>4.5 - 6.0</td>
</tr>
<tr>
<td></td>
<td>at 50 g/l</td>
</tr>
<tr>
<td></td>
<td>20 °C</td>
</tr>
<tr>
<td>Melting point</td>
<td>26 - 27 °C</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flash point</td>
<td>does not flash</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No information available.</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>No information available.</td>
</tr>
<tr>
<td>Relative vapour density</td>
<td>No information available.</td>
</tr>
<tr>
<td>Density</td>
<td>2.11 g/cm³</td>
</tr>
<tr>
<td></td>
<td>at 20 °C</td>
</tr>
<tr>
<td>Relative density</td>
<td>No information available.</td>
</tr>
<tr>
<td>Water solubility</td>
<td>at 20 °C</td>
</tr>
<tr>
<td></td>
<td>soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No information available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No information available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>850 °C</td>
</tr>
<tr>
<td></td>
<td>(anhydrous substance)</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No information available.</td>
</tr>
</tbody>
</table>
Explosive properties
No information available.

Oxidizing properties
No information available.

9.2 Other data
Ignition temperature
Not applicable

Bulk density
ca.1.000 - 1.200 kg/m³

SECTION 10. Stability and reactivity
10.1 Reactivity
See section 10.3

10.2 Chemical stability
releases water of crystallisation when heated.

10.3 Possibility of hazardous reactions
no information available

10.4 Conditions to avoid
Heating.

10.5 Incompatible materials
no information available

10.6 Hazardous decomposition products
in the event of fire: See section 5.

SECTION 11. Toxicological information
11.1 Information on toxicological effects

Acute oral toxicity
LD50 Rat: 2.150 mg/kg (anhydrous substance) (IUCLID)
Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract., Nausea, Vomiting, gastric pain, Diarrhoea

Acute inhalation toxicity
Symptoms: tissue damage, Pneumonia

Acute dermal toxicity
This information is not available.

Skin irritation
This information is not available.

Eye irritation
This information is not available.

Sensitisation
This information is not available.

Germ cell mutagenicity
This information is not available.

Carcinogenicity
This information is not available.
Reproductive toxicity
This information is not available.

Teratogenicity
This information is not available.

Specific target organ toxicity - single exposure
This information is not available.

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard
This information is not available.

11.2 Further information
Manganese compounds are generally only very slightly absorbable via the gastrointestinal tract.
Further data:
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

12.1 Toxicity
Toxicity to fish
LC50 Pimephales promelas (fathead minnow): 30,6 mg/l; 96 h (anhydrous substance) (ECOTOX Database)

Toxicity to daphnia and other aquatic invertebrates
EC50 Daphnia magna (Water flea): 8,3 mg/l; 48 h (anhydrous substance) (ECOTOX Database)

12.2 Persistence and degradability
No information available.

12.3 Bioaccumulative potential
No information available.

12.4 Mobility in soil
No information available.

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects
Additional ecological information
Discharge into the environment must be avoided.
SECTION 13. Disposal considerations

Waste treatment methods
See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14. Transport information

Land transport (ADR/RID)

14.1 UN number UN 3077
14.2 Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (MANGANESE(II)-SULPHATE)
14.3 Class 9
14.4 Packing group III
14.5 Environmentally hazardous yes
14.6 Special precautions for user yes
Tunnel restriction code E
Packages smaller than or equal to 5 kg / L , not dangerous goods of Class 9

Inland waterway transport (ADN)
Not relevant

Air transport (IATA)

14.1 UN number UN 3077
14.2 Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (MANGANESE(II)-SULPHATE)
14.3 Class 9
14.4 Packing group III
14.5 Environmentally hazardous yes
14.6 Special precautions for user no
Packages smaller than or equal to 5 kg / L , not dangerous goods of Class 9

Sea transport (IMDG)

14.1 UN number UN 3077
14.2 Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (MANGANESE(II)-SULPHATE)
14.3 Class 9
14.4 Packing group III
14.5 Environmentally hazardous yes
14.6 Special precautions for user yes
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not relevant

EmS F-A S-F
Packages smaller than or equal to 5 kg / L , not dangerous goods of Class 9
SECTION 15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

_EU regulations_  
**Major Accident Hazard Legislation**  
96/82/EC  
Dangerous for the environment  
9b  
Quantity 1: 200 t  
Quantity 2: 500 t  

_Occupational restrictions_  
Take note of Dir 94/33/EC on the protection of young people at work. Take note of Dir 92/85/EEC on the safety and health at work of pregnant workers.

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer  
not regulated  

not regulated  

Regulation (EC) No 689/2008 concerning the export and import of dangerous chemicals  
not regulated  

_Substances of very high concern (SVHC)_  
This product does not contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 57 above the respective regulatory concentration limit of ≥ 0.1 % (w/w).

_National legislation_  
_Storage class_  
10 - 13

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out.

SECTION 16. Other information

**Full text of H-statements referred to under sections 2 and 3.**

_H373_  
May cause damage to organs through prolonged or repeated exposure.

_H411_  
Toxic to aquatic life with long lasting effects.

**Full text of R-phrases referred to under sections 2 and 3**

_R48/20/22_  
Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

_R51/53_  
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Training advice**

Provide adequate information, instruction and training for operators.
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Catalogue No. 102786
Product name Manganese(II) sulfate tetrahydrate for analysis EMSURE®

Labelling
Hazard pictograms

Signal word
Warning

Hazard statements
H373 May cause damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements
Prevention
P273 Avoid release to the environment.
Response
P314 Get medical advice/ attention if you feel unwell.

Labelling (67/548/EEC or 1999/45/EC)
Symbol(s) Xn Harmful
N Dangerous for the environment
R-phrase(s) 48/20/22-51/53 Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S-phrase(s) 22-61 Do not breathe dust. Avoid release to the environment. Refer to special instructions/ Safety data sheets.
EC-No. 232-089-9 EC Label

Reduced labelling (≤125 ml)
Symbol(s) Xn Harmful
N Dangerous for the environment
R-phrase(s) 48/20/22 Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

Key or legend to abbreviations and acronyms used in the safety data sheet
Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Regional representation
This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.