Material Safety Data Sheet

MANNITOL

Section 1 - Product Identification

Synonyms : Osmitrol, manna sugar, 1,2,3,4,5,6-hexanehexol

Molecular Weight : 182.17 g/mol

Chemical Formula : $C_6H_{14}O_6$

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Recommended use of the chemical and restrictions on use

The product is used in industrial manufacturing, in particular in :

- Food
- Pharmaceutical
- Clinical application

Section 2 – Composition/Information on Ingredients

The product contains greater than 99.0 percent (%) Mannitol, $C_6H_{14}O_6$

Chemical Name	EC No/CAS No	Purity, %
Mannitol, 1,2,3,4,5,6- hexanehexol	200-711-8 69-65-8	min. 99.0

Section 3 – Hazards Identification

3.1 Classification of the substance according to GHS

Mannitol is not a hazardous substance or mixture.

3.2. GHS Label elements, including precautionary statements

Mannitol is not a hazardous substance or mixture.

3.3. Other hazards which do not result in classification

Mannitol is not a hazardous substance or mixture.

Potential health effects

Ingestion is the most significant route of exposure in occupational and other settings.

Inhalation

Occasional mild irritation effects to nose and throat may occur from inhalation of mannitol powder.

Eye contact

Mannitol powder can be an eye irritant.

Skin contact

Mannitol does not cause irritation to intact skin.

Ingestion

Mannitol is safe for consumption. Overdose of mannitol of more than 1.5 g/kg bw can cause acute renal failure, electrolyte imbalance, hypervolaemia and CNS toxicity.

Potential ecological effects

Mannitol has no significant ecological effects if released into environment as it is naturally occurring in vegetables and fruits. Products of short-term degradation are non toxic. (sciencelab, 2013)

Signs and symptoms of exposure

Symptoms of over-exposure to mannitol have been associated with ingestion. These may include acute renal failure, hypervolaemia and CNS toxicity. Infusion site may show signs of irritation and inflammation. There will be no significant effect on dermal exposure.

Section 4 – First-Aid Measures

4.1. Description of first aid mesaures

Skin contact

No treatment necessary because non-irritating.

Eye contact

Use eye wash fountain or fresh water to cleanse eye. If irritation persists for more than 30 minutes, seek medical attention.

Inhalation

If symptoms such as nose or throat irritation are observed, remove to fresh air.

Ingestion

If large amounts are swallowed (i.e. more than one teaspoon), contact a doctor or toxicity centre immediately.

Note to physicians

Observation only is required for adult ingestion of 1.5g/kg bw. For ingestion in excess mannitol, monitor fluid and electrolyte balance. Haemodialysis should be reserved for massive acute ingestion or patients with renal failure.

4.2. Most important symptoms and effects, both acute and delayed

Acute renal failure, hypervolaemia, CNS toxicity.

4.3. Indication of any immediate medical attention and special treatment needed

N.A.

Section 5 – Fire Fighting Measures

5.1. Suitable Extinguishing media

Any fire extinguishing media may be used on nearby fires.

5.2. Specific hazards arising from the chemical

Mannitol is not flammable.

5.3. Special protective actions for fire-fighters

N.A.

Section 6 – Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid dust formation. In case of exposure to prolonged or high level of airborne dust, wear a personal respirator in compliance with national legislation.

6.2. Environmental precautions

Mannitol is a water-soluble white powder that has no effect on the environment as it is naturally occurring.

6.3. Methods and material for containment and cleaning up

Land spill

Vacuum, shovel or sweep up mannitol and place in containers for disposal in accordance with applicable local regulations. Avoid contamination of water bodies during clean up and disposal. No personal protective equipment is needed to clean up land spills.

Spillage into water

Where possible, remove any intact containers from the water. Advise local water authority that none of the affected water should be used for irrigation or for the abstraction of potable water until mannitol concentration in water returns to 0.

Section 7 – Handling and Storage

7.1. Precautions for safe Handling

To maintain package integrity and to minimise caking of the product, bags should be handled on a first-in first out basis. Good housekeeping and dust prevention procedures should be followed to minimise dust generation and accumulation. Your supplier can advise you on safe handling, please contact the supplier.

The product should be kept away from strong reducing agents. Apply above handling advice when mixing with other substances.

7.2. Conditions for safe storage, including any incompatibilities

No special handling precautions are required, but dry, indoor storage is recommended. No specific requirements. Provide appropriate ventilation and store bags such as to prevent any accidental damage.

Section 8 – Exposure Controls/Personal Protection

8.1. Control parameters

Occupational exposure limits for dust (total and respirable). are treated by OSHA, Cal OSHA and ACGIH as "Particulate Not Otherwise Classifed" or "Nuisance Dust"

ACGIH/TLV 10 mg/m^3

Cal OSHA/PEL 10 mg/m^3

OSHA/PEL (total dust) 15 mg/m^3

OSHA/PEL (respirable dust) 5 mg/m^3

8.2. Appropriate engineering controls

Maintain air concentrations below occupational exposure standards.

Use local exhaust ventilation to keep airborne concentrations of mannitol dust below permissible exposure levels. Wash hands before breaks and at the end of the workday. Remove and wash soiled clothing.

8.3. Individual protection measures, such as personal protective equipment (PPE)

Respiratory protection

In case of prolonged exposure to dust wear a personal respirator in compliance with national legislation (make reference to the appropriate CEN standard)

Eyes and hands protection

Goggles and gloves are not required for normal industrial exposures, but may be warranted if environment is excessively dusty.

Section 9 – Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance : white solid, powder

Odour : odourless

Odour threshold : N.A.

pH @ 20°C : 6.3 (20 % solution)

Melting point : 162.15°C

Boiling point : 29 °C

Flash point : Non flammable

Evaporation rate : N.A.

Flammability : N.A.

Upper/lower flammability or explosive limits : Non explosive

Vapour pressure : Negligible @ 20°C

Vapour density : N.A.

Relative density : 1.52 g/mL

Solubility in water : 21.6 mg/mL @ 25°C

Partition coefficient: n-octanol/water : N.A

Auto-ignition temperature : N.A.

Decomposition temperature : 300.15°C

Viscosity : N.A.

9.2. Other information

Molecular weight : 182.17 g/mol

Specific gravity : 1.81 @ 20°C

Section 10 – Stability and Reactivity

10.1. Reactivity

Mannitol is a stable product.

10.2. Chemical stability

Mannitol is a stable product, but when heated it vaporizes.

10.3. Possibility of hazardous reactions

Mannitol is a chemically stable product. It is slightly acidic and may react with alkali in neutralization.

10.4. Conditions to avoid:

N.A.

10.5. Incompatible materials

Avoid contact with strong alkali agents.

10.6. Hazardous decomposition products

N.A.

Section 11 – Toxicological Information

11.1. Information on toxicological effect

11.1.1. Substances

Acute toxicity[2]

Low acute oral toxicity; LD50 in rats > 13500 mg/kg of body weight. (sciencelab, 2013)

Skin corrosion / irritation[3]

Low acute dermal toxicity; LD50 in rats > 13500mg/kg of body weight. (BD, 2004)

Serious eye damage/ irritation

Mannitol can be an eye irritant if it comes in contact with eyes.

Respiratory or skin sensitization

Mannitol is not a skin sensitizer.

Germcell mutagenicity

Mannitol is not mutagenic.

Carcinogenicity

Mannitol is not carcinegenic

Reproductive toxicity

Mannitol is not known to have reproductive toxicity.

STOT-single exposure

N.A.

STOT-repeated exposure

N.A.

Aspiration Hazard

Mannitol has no aspiration hazard.

Section 12 – Ecological Information

12.1.Toxicity

Mannitol occurs naturally in vegetables and fruits. It has no known toxicity on the environment.

Phytotoxicity

Mannitol can be harmful to plants in higher quantities as phytotoxic herbarumin can be synthesised from mannitol. Care should be taken to minimise the amount of mannitol released to the environment.

Algal toxicity

No known toxicity on algae.

Invertebrate toxicity

No known toxicity on invertebrate.

Fish toxicity

No known toxicity on fish.

12.2. Persistence and degradability

Mannitol is naturally occurring and ubiquitous in the environment. Products of degradation are non-toxic.

12.3. Bioaccumulative potential

Not significantly bioaccumulative.

12.4. Mobility in soil

The product is soluble in water and is leachable through normal soil.

12.5. Other adverse effects

No Data Available

Section 13 – Disposal Considerations

13.1. Disposal methods

Small quantities of mannitol can usually be disposed of at landfill sites. No special disposal treatment is required, but local authorities should be consulted about any specific local requirements. Tonnage quantities of product are not recommended to be sent to landfills. Such product should, if possible, be used for an appropriate application.

Section 14 – Transport Information

Mannitol has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

14.1. UN number : N.A.

14.2. UN proper shipping name : N.A

14.3. Transport of hazard classes : N.A

14.4. Packing group : N.A

14.5. Environmental hazards : N.A.

14.6. Special precautions for user : N.A

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: N.A.

Section 15 – Regulatory Information

15.1. Safety, health and environmental regulations

It should be noted that mannitol are safe under conditions of normal handling and use, besides, they are essential nutrients to plants, and research shows that they play a beneficial role in human health. CLP classification has been solely based on animal tests where animals were exposed to high doses of mannitol over long periods of time. These doses were many times higher than humans are exposed to under conditions of normal handling and use. Consequently, a precautionary decision was taken by the European Commission. Although we will comply with the body of legislation triggered by that decision, we are in process of all possible legal actions.

Clean Air Act (Montreal Protocol)

Mannitol was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

Chemical inventory listing

U.S. EPA TSCA Inventory	1330-43-4
Canadian DSL	1330-43-4
EINECS	215-540-4
South Korea	1-760
Japanese MITI	(1)-69

Ensure all national/local regulations are observed.

Section 16 : Additional Information

16.1. Mainly changes made to the previous version of this Material Safety Data Sheet (MSDS):

• This MSDS complies with ISO 11014; the requirements of UN-GHS

Revision No	Revision content
05	• This SDS is updated in accordance with the GHS (Rev.6) (2015)-Guidance on the Compilation of Safety data Sheets. • This SDS is updated in line with Eti Maden Corporate identity.

16.2. List of abbreviation and acronyms used in this MSDS

SDS : Safety Data Sheets

Index N° : atomic number of the element most characteristic of the properties of the substance

CAS No : Chemical Abstracts Service number

EC No : EINECS Number : European Inventory of Existing Commercial Substances

Repr. Cat. 2 : Substance presumed human reproductive toxicant

Acute Oral Cat. 5 : Substance which is of relatively low acute oral toxicity.

GHS : Globally Harmonised System of Classification and Labelling

LD_{50} : Median Lethal Dose

LC_{50} : Lethal Concentration, 50%

N.A. : Not Applicable

OSHA : Occupational Safety & Health Administration

Cal OSHA : The State of California Division of Occupational Safety and Health (DOSH)

PEL : Permissible Exposure Limits

ACGIH : American Conference of Governmental Industrial Hygienists

TLV : Threshold Limit Value

Japanese MITI : Japanese Ministry of International Trade and Industry

EC_{50} : Half maximal effective concentration

UN : United Nations

U.S. EPA TSCA Inventory: Inventory of the chemical substances manufactured or processed in the United States according to Toxic Substances Control Act compiled and published under the authority of the Environmental Protection Agency

Canadian DSL: Canadian Domestic Substances List

16.3. List of relevant hazard statements and precautionary statements used in this MSDS

Mannitol is not a hazardous substance or mixture.

16.4. References

1. BD. (2004). *Material Safety Data Sheet.*

2. sciencelab. (2013). *Mannitol MSDS.* Texes.

16.5. Disclaimer of Liability

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its accuracy, reliability or completeness. The conditions or methods of handling, storage use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. It is the user's responsibility to satisfy himself as to the suitableness and completeness of such information for his own particular use.

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