SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Ascorbic Acid
Substance name	:	L-Ascorbic acid
CAS-No.	:	50-81-7

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

Use of the Substance/Mixture	:	Additive for animal nutrition to be used in feed, For the fortification of foods, Ingredient/additive for dietary supplements, Ingredient for pharmaceutical products

1.3 Details of the supplier of the safety data sheet

Company	:	DSM Nutritional Products 45 Waterview Blvd US-07054-1298 Parsippany
Telephone	:	(908) 475-7373
Telefax	:	(908) 475-7406
E-mail address Responsible/issuing person	:	sds.nutritionalproducts@dsm.com

1.4 Emergency telephone number

Emergency # 1-800-424-9300 (24 HR CHEMTREC)

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	crystalline, powder
Colour	white, pale yellow
Odour	odourless

GHS Classification

Combustible dust :

GHS Label element

Signal word : Warning

Hazard statements : May form combustible dust concentrations in air

Potential Health Effects

Aggravated Medical Condition : None known.

Symptoms of Overexposure : No specific symptoms known.

Experience with human exposure

Skin contact :

May be slightly irritating, especially on damp skin.

Ingestion : Oral intake up to 9 g ascorbic acid per day does not produce any serious toxic effects. However, diarrhoea can occur even with lower consumption levels.

Carcinogenicity:

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

OSHA No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Additional hazards and advice

Risk of dust explosion.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : L-threo-hex-2-enonic acid gamma-lactone
3-oxo-L-gulofuranolactone

Brief description of the product : Substance

Molecular formula : C6 H8 O6

Hazardous components

Component	CAS-No.	Weight percent
methanol	67-56-1	0 - 0.3

Further ingredients

Component	CAS-No.	Weight percent
ascorbic acid (Vitamin C)	50-81-7	99 - 100

SECTION 4. FIRST AID MEASURES

General advice : No hazards which require special first aid measures.

If inhaled : Move to fresh air.
If symptoms persist, call a physician.

In case of skin contact : Take off contaminated clothing and shoes immediately.
Wash off with soap and plenty of water.

In case of eye contact : Flush eyes with water as a precaution.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.

If swallowed : Clean mouth with water and drink afterwards plenty of water.

Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed : No specific symptoms known.

Notes to physician : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Flammable properties

Flash point : Not applicable

Fire fighting

Suitable extinguishing media : Water
Foam

Further information : Consider dust explosion hazard.

Protective equipment and precautions for firefighters

Specific hazards during fire-fighting : None known.

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

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Avoid dust formation.

Environmental precautions : Try to prevent the material from entering drains or water courses.

Methods and materials for containment and cleaning up : Sweep up and shovel.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : For personal protection see section 8.

Advice on protection against fire and explosion : Avoid dust formation.
Provide appropriate exhaust ventilation at places where dust is formed.
Take precautionary measures against static discharges.

Conditions for safe storage : Protect from humidity.

Keep container tightly closed and dry.

Materials to avoid : No special restrictions on storage with other products.

Storage temperature : < 77 °F (< 25 °C)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sam-pling time	Permissible concentra-tion	Basis
	67-56-1	Methanol	Urine	End of shift (As soon as possible after exposure ceases)	15 mg/l	ACGIH BEI

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.
In case of high dust concentration use a dust mask applicable to local conditions.

Hand protection : Glove material: for example nitrile rubber

Eye protection : Safety glasses

Skin and body protection : Lightweight protective clothing

Hygiene measures : General industrial hygiene practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance : crystalline, powder

Colour : white - pale yellow

Odour : odourless

Odour Threshold : No information available.

pH : 2.2 - 2.5 (5%)
(as aqueous solution)

Melting point/range : ca. 190 °C
with decomposition

Boiling point/boiling range : not determined

Flash point : Not applicable

Flammability (solid, gas) : May form combustible dust concentrations in air

Vapour pressure : < 0.001 hPa (at 25 °C; calculated (citation from literature))

Relative vapour density	:	Not applicable
Density	:	not determined
Water solubility	:	ca. 300 g/l (20 °C)
Solubility in other solvents	:	Ethanol: ca.20 g/l
		Ether: practically insoluble
		Glycerol: ca.10 g/l
Partition coefficient: n-octanol/water	:	log Pow -2.0
Auto-ignition temperature	:	No data available
Thermal decomposition	:	Decomposes on heating. Potential for exothermic hazard Heating can release hazardous gases.
Explosive properties	:	No data available
Oxidizing properties	:	No data available

9.2 Other information

Combustibility index for deposited dust	:	2 (23 °C)
	:	2 (100 °C)
Dust explosion class	:	St(H)1 (Milled sample, Median value of the tested sample 0.017 mm, Loss on drying 0.3 %; The value was determined in the modified Hartmann tube.)
Minimum ignition energy	:	10 - 30 mJ (Milled sample, Median value of the tested sample 0.017 mm, Loss on drying 0.3 %, EN 13821) The Minimum ignition energy (MIE) of a dust/air mix depends on the particle size the water content and the temperature of the dust. The finer and the dryer the dust the lower the MIE.
	:	General remark: The indicated dust explosion characteristics are only valid for this product and are sensitive to the sample's parameters.
Powder volume resistivity	:	ca. 7E+10 Ohmm (Product sample, Median value of the tested sample 0.388 mm, Loss on drying 0.2 %) The material can accumulate static charge and can therefore cause electrical ignition.
Minimum ignition temperature of a dust/air mix	:	350 °C (Median value of the tested sample 0.388 mm) determined in the BAM oven
Molecular weight	:	176.13 g/mol
Particle size	:	<= 20 % <= 0.075 mm
Dissociation constant	:	pKa 4.17
	:	pKa 11.57

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No hazards to be specially mentioned.
Chemical stability	:	Stable under recommended storage conditions.
Possibility of hazardous reactions	:	Dust may form explosive mixture in air.
Conditions to avoid	:	Exposure to air. (as aqueous solution) Heat.
Incompatible materials	:	Oxidizing agents Bases
Hazardous decomposition products	:	No decomposition if used as directed.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	:	LD50 (Rat): 11,290 mg/kg
Acute inhalation toxicity	:	No data available
Acute dermal toxicity	:	Acute toxicity estimate : > 5,000 mg/kg (Calculation method)
Skin irritation	:	No skin irritation (Rabbit, OECD Test Guideline 404, 4 h)
Eye irritation	:	No eye irritation (Rabbit, OECD Test Guideline 405)
	:	Dust contact with the eyes can lead to mechanical irritation.
Sensitisation	:	Did not cause sensitization. (Guinea pig, Optimization Test (Maurer))
Carcinogenicity	:	(several species) No indication for carcinogenicity known.
Genotoxicity in vivo	:	No indication for human genotoxicity known.
Reproductive toxicity	:	This information is not available.
Teratogenicity	:	not teratogenic not embryotoxic (several species)

STOT - single exposure (Acute exposure)	:	The substance or mixture is not classified as specific target organ toxicant, single exposure.
STOT - repeated exposure	:	NOAEL (Oral, Rat) : 2000 mg/kg bw/d Chronic toxicity study (2 years)
Experience with human exposure	:	RDA (Recommended Daily Allowance) 60 mg
Experience with human exposure: Skin contact	:	May be slightly irritating, especially on damp skin.
Experience with human exposure: Ingestion	:	Oral intake up to 9 g ascorbic acid per day does not produce any serious toxic effects. However, diarrhoea can occur even with lower consumption levels.
Aspiration toxicity	:	No aspiration toxicity classification

SECTION 12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish	:	Oncorhynchus mykiss (rainbow trout) LC50 (96 h) 1,020 mg/l (OECD Test Guideline 203)

Persistence and degradability

Biodegradability	:	Well inherently biodegradable. 100 % (15 d) 97 %, (5 d) (OECD Test Guideline 302B)

Bioaccumulative potential

Bioaccumulation	:	Bioaccumulation is unlikely.
Partition coefficient: n-octanol/water	:	log Pow -2.0

Mobility in soil

Distribution among environmental compartments	:	No data available

Results of PBT and vPvB assessment

Assessment	:	The substance does not fullfill the PBT criteria. : The substance does not fullfill the vPvB criteria.

Other adverse effects

Regulation	40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks	This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act

Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information : There is no data available for this product.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : User must determine if any wastes generated exhibit hazardous characteristics as per 40 CFR Part 261 or other national / local legislation.

Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14. TRANSPORT INFORMATION

International Regulation

UNRTDG
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations

49 CFR
Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

TSCA list : Not relevant

Not relevant

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
	67-56-1	5000	*

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Fire Hazard

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

ascorbic acid	50-81-7	90 - 100 %
methanol	67-56-1	0.1 - 1 %

New Jersey Right To Know

ascorbic acid	50-81-7	90 - 100 %
methanol	67-56-1	0.1 - 1 %

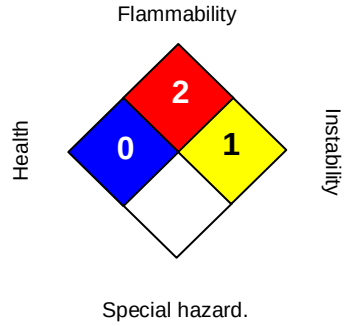
The components of this product are reported in the following inventories:

TSCA : On TSCA Inventory

SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS III:

HEALTH	0
FLAMMABILITY	2
PHYSICAL HAZARD	1

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Abbreviations: ACGIH = American Conference of Governmental Industrial Hygienists. CERCLA = Comprehensive Environmental Response, Compensation and Liability Act. CFR = Code of Federal Regulations. CPR = Controlled Products Regulations. DSL = Canadian Domestic Substance List. DOT = Department of Transportation. EINECS = European Inventory of New and Existing Chemical Substances. EPA = Environmental Protection Agency. HCS = Hazardous Communication Standard. HEPA = High Efficiency Particulate Air. HMIS = Hazardous Material Identification System. IARC = International Agency for Research on Cancer. IATA = International Air Transport Association. IMDG = International Maritime Dangerous Good. NFPA = National Fire Protection Association. NIOSH = National Institute of Occupational Safety and Health. NJTSR = New Jersey Trade Secret Registry. NTP = National Toxicology Program. OSHA = Occupational Safety and Health Administration. SARA = Superfund Amendments and Reauthorization Act. TDG = Transportation of Dangerous Goods. TLV = Threshold Limit Value. TSCA = Toxic Substance Control Act. WHMIS = Workplace Hazardous Materials Information System.