Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
Succinic Acid
Synonyms
Butanedioic acid; Amber acid; 1,2-Ethanedicarboxylic acid; Ethylenesuccinic acid; Wormwood; Wormwood acid
Chemical Family
carboxylic acids, aliphatic
Product Use
Formulation stage, manufacturing, Industrial End-use stage cleaning, Professional End-use stage cleaning, Consumer End-use stage cleaning, Laboratory use, Use as a monomer, Use as an intermediate
Restrictions on Use
None known.

Details of the supplier of the safety data sheet

Myriant Corporation
3 Batterymarch Park, 3rd Floor
Quincy, MA 02169

Telephone No : 617-657-5200
Email : productsafety@myriant.com
Emergency Phone No : CHEMTREC: 800-424-9300

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.
Combustible Dust
Serious Eye Damage/Eye Irritation - Category 1

GHS Label Elements

Symbol(s)

Signal Word
Danger

Hazard Statement(s)
May form combustible dust concentrations in air
Causes serious eye damage

Precautionary Statement(s)

Prevention
Wear eye protection/face protection

Response
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing
Immediately call a POISON CENTER or doctor

Storage
None needed according to classification criteria

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations

Other Hazards
No additional information available

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component	Percent
110-15-6	Succinic acid	>= 99.5

Section 4 - FIRST AID MEASURES

Description of Necessary Measures
Get medical advice/attention if you feel unwell.

Inhalation
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin
Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse.

Eyes
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

Ingestion
Get medical attention, if needed.

Indication of any immediate medical attention and special treatment needed
Treat symptomatically and supportively.

Most Important Symptoms/Effects

Acute
Causes serious eye damage.

Delayed
No information on significant adverse effects.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media
Use carbon dioxide, regular dry chemical, regular foam or water.

Unsuitable Extinguishing Media
Do not use high-pressure water streams.

Special Hazards Arising from the Chemical
Combustible Dust. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Hazardous Combustion Products
Oxides of carbon, low molecular weight hydrocarbons

Advice for firefighters
Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Fire Fighting Measures
Move container from fire area if it can be done without risk. Do not scatter spilled material with high-pressure water streams. Dike for later disposal. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up
Keep unnecessary people away, isolate hazard area and deny entry. Avoid contact with eyes, skin and clothing. Do not breathe dust. If respirable dusts are generated, respiratory protection may be needed. Only personnel trained for the hazards of this material should perform clean up and disposal. Collect spilled material using mechanical equipment. Minimize dust generation and accumulation. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Use non-sparking tools and equipment.

Environmental Precautions
Collect spillage. Avoid release to the environment. In case of spillage, stop the flow of material and block any potential routes to water systems. Keep out of water supplies and sewers.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling
Do not handle until all safety precautions have been read and understood. Keep away from all ignition sources. Do not breathe dust. Use methods to minimize dust. Avoid contact with skin and eyes. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product. Always wear recommended personal protective equipment. Wear personal protective clothing and equipment, see Section 8. Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Take precautionary measures against static discharges.

Conditions for Safe Storage, Including any Incompatibilities
None needed according to classification criteria

Store in a cool, dry place. Store in a well-ventilated area. Keep separated from incompatible substances. Store with acids. Keep container tightly closed. Empty containers may contain product residue. Do not reuse containers. Store and handle in accordance with all current regulations and standards.

Incompatible Materials
strong oxidizing agents, alkali solutions

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

ACGIH, NIOSH, EU, OSHA (US) and Mexico have not developed exposure limits for any of this product's components

Biological limit value
There are no biological limit values for any of this product's components.

Engineering Controls
Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection
Wear splash resistant safety goggles with a faceshield.

Skin Protection
Wear appropriate chemical resistant clothing.

Respiratory Protection
A NIOSH approved air-purifying respirator with an appropriate cartridge or canister may be appropriate under certain circumstances where airborne concentrations are expected to exceed exposure limits.

Glove Recommendations
Wear appropriate chemical resistant gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	white crystalline solid	**Physical State**	solid
Odor	odorless	**Color**	white
Odor Threshold	Not available	**pH**	2.7
Melting Point	185 - 187 °C (365-368.6 °F)	**Boiling Point**	235 °C (455 °F)
Freezing point	185 - 187 °C	**Evaporation Rate**	Not available
Boiling Point Range	Not available	**Flammability (solid, gas)**	Not flammable
Autoignition	None (determined up to 220 °C)	**Flash Point**	Not applicable
Lower Explosive Limit	Non-explosive	**Decomposition**	Not available
Upper Explosive Limit	Non-explosive	**Vapor Pressure**	1.9E-07 mmHg
Vapor Density (air=1)	Not available	**Specific Gravity (water=1)**	1.564 (15 °C)
Water Solubility	83 g/L (@ 25 °C)	**Partition coefficient: n-octanol/water**	0.257
Viscosity	Not applicable	**Solubility (Other)**	Not available
Density	1.6 g/cc at 25 °C	**KOC**	1419.06 (estimated)
Log KOW	-0.59	**Molecular Formula**	C4-H6-O4

Molecular Weight	118 g/mol		

Other Information
No additional information available.

Section 10 - STABILITY AND REACTIVITY

Reactivity
No reactivity hazard is expected.

Chemical Stability
Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions
Hazardous polymerization will not occur.

Conditions to Avoid
Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials. Avoid generating dust.

Incompatible Materials
strong oxidizing agents, alkali solutions

Hazardous decomposition products
Oxides of carbon, low molecular weight hydrocarbons

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure
Inhalation
No information on significant adverse effects.
Skin Contact
No information on significant adverse effects.
Eye Contact
Causes serious eye damage.
Ingestion
Ingestion may cause gastrointestinal irritation, nausea, stomach pain, vomiting, diarrhea.

Acute and Chronic Toxicity

Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and the following selected endpoints are published:
Succinic acid (110-15-6)
Oral LD50 Rat 6740 mg/kg bw
Dermal LD50 6740 mg/kg bw
Inhalation LC50 Rat 1284 mg/m3 air 4 h

Immediate Effects
Causes serious eye damage.

Delayed Effects
No information on significant adverse effects.

Irritation/Corrosivity Data
Causes serious eye damage. Not irritating to respiratory system, skin.

Respiratory Sensitization
Reported to be non-sensitizing.

Dermal Sensitization
Reported to be non-sensitizing.

Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA
Not classified.

Germ Cell Mutagenicity
Ames test found to be negative.

Tumorigenic Data
Not classified.

Reproductive Toxicity
Not classified.

Specific Target Organ Toxicity - Single Exposure
No target organs identified.

Specific Target Organ Toxicity - Repeated Exposure
No target organs identified.

Aspiration hazard
No data available.

Medical Conditions Aggravated by Exposure
May cause skin disorders, eye disorders, respiratory disorders.

Additional Data
No additional information available.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity
Avoid release to the environment.

Component Analysis - Aquatic Toxicity

Succinic acid	110-15-6
Fish:	LC50 96 hr Danio rerio >100 mg/L [semi-static]
Algae:	EC50 72 hr Pseudokirchnerella subcapitata >100 mg/L [static]
Invertebrate:	EC50 48 hr Daphnia magna >100 mg/L [semi-static]; EC50 48 hr Daphnia magna 374.2 mg/L [static]

Persistence and Degradability
Readily biodegradable; not persistent.

Bioaccumulative Potential
Low soil Adsorption; low potential to bioaccumulate

Mobility
No information available for the product.

Other Toxicity
No additional information available.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose of contents/container in accordance with local/regional/national/international regulations.
Component Waste Numbers
The U.S. EPA has not published waste numbers for this product's components

Section 14 - TRANSPORT INFORMATION

IATA Information:
UN#: Not regulated for transport

IMDG Information:
UN#: Not regulated for transport

US DOT Information:
UN/NA #: Not regulated for transport

TDG Information:
UN#: Not regulated for transport

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations
None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA Section 311/312 (40 CFR 370 Subparts B and C)
Acute Health: Yes **Chronic Health:** No **Fire:** Yes **Pressure:** No **Reactivity:** No

U.S. State Regulations
None of this product's components are listed on the state lists from CA, MA, MN, NJ or PA

Not listed under California Proposition 65

Canadian WHMIS Ingredient Disclosure List (IDL)
Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

Succinic acid	110-15-6
	1 %

Component Analysis - Inventory

Succinic acid (110-15-6)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes

Section 16 - OTHER INFORMATION

HMIS Rating
Health: 3 Fire: 1 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

NFPA Ratings
Health: 3 Fire: 1 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes
Supersedes SDS written on July 17, 2013

Key / Legend
ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:
Reasonable care has been taken in the preparation of this information; however, the manufacturer makes no warranty whatsoever including the warranty of merchantability, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental, consequential, or other such damages resulting from its use or misuse.