

SAFETY DATA SHEET

Preparation Date: 8/5/2014

Revision date 07/11/2019

Revision Number: G2

1. IDENTIFICATION

Product identifier

Product code: MA147
Product Name: Malic Acid, FCC

Other means of identification

Synonyms: DL-Malic Acid
 DL-Hydroxysuccinic Acid
 Deoxytetraic acid
 Hydroxybutanedioic Acid
 Hydroxysuccinic Acid
 alpha-Hydroxysuccinic acid
 Butanedioic acid, hydroxy-
 Succinic acid, hydroxy-
CAS #: 617-48-1 (CAS number currently used by USP, but is considered obsolete or deleted by Chemical Abstract Service)
 6915-15-7 (Current CAS number assigned by Chemical Abstract Service)
RTECS # ON7175000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: Food Additive. In Foods. In beverages.
Uses advised against No information available

Supplier: Spectrum Chemical Mfg. Corp
 14422 South San Pedro St.
 Gardena, CA 90248
 (310) 516-8000

Order Online At: <https://www.spectrumchemical.com>
Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Tom Tyner (USA - West Coast)
Contact Person: Ibad Tirmiz (USA - East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

| | |
|-----------------------------------|-------------|
| Acute toxicity - Oral | Category 4 |
| Skin corrosion/irritation | Category 2 |
| Serious eye damage/eye irritation | Category 2A |

Label elements

Warning**Hazard statements**

Harmful if swallowed
Causes skin irritation
Causes serious eye irritation

**Hazards not otherwise classified (HNOC)**

Not Applicable

Other hazards

Not available

Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
IF ON SKIN: Wash with plenty of water
If skin irritation occurs: Get medical attention
Take off contaminated clothing and wash it before reuse
IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell
Rinse mouth

Precautionary Statements - Disposal

Dispose of contents and container to an approved waste disposal plant in accordance with local, regional, national and international regulations as applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS No | Weight-% |
|---|----------|----------|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | 100 |

4. FIRST AID MEASURES**First aid measures****General Advice:**

National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222.

Skin Contact:

Wash off immediately with soap and plenty of water removing all contaminated clothing and shoes. Get medical attention. If skin irritation persists, call a physician.

Eye Contact:

Flush eyes with water for 15 minutes. Get medical attention.

Inhalation:

Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give

oxygen. Get medical attention.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms Irritating to eyes and skin
Ingestion may cause nausea, vomiting, and diarrhea
Weakness
May affect respiration
May cause cyanosis

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically.

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Dry chemical. Carbon dioxide (CO₂). Water spray mist or foam.

Unsuitable Extinguishing Media: No information available.

Specific hazards arising from the chemical

Hazardous combustion products Carbon monoxide. Carbon dioxide (CO₂).

Specific hazards May be combustible at high temperatures.

Special Protective Actions for Firefighters

Specific Methods: No information available

Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions: Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Avoid dust formation. Remove all sources of ignition.

Environmental precautions Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading.

Methods for cleaning up Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:

Provide sufficient air exchange and/or exhaust in work rooms. Avoid dust formation. Keep away from incompatible materials.

Safe Handling Advice:

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not ingest. Do not breathe dust. Keep away from heat and sources of ignition. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:

Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials.

Incompatible Materials:

Oxidizing agents
Bases
Amines
carbonates
Alkali Metals

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

| Component | CAS No | OSHA | NIOSH | ACGIH | AIHA WEEL |
|---|----------|------|-------|-------|-----------|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | None | None | None | None |

Canada

| Component | CAS No | Canada - Alberta | Canada - British Columbia | Canada - Ontario | Canada - Quebec |
|---|----------|------------------|---------------------------|------------------|-----------------|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | None | None | None | None |

Australia and Mexico

| Component | CAS No | Australia | Mexico |
|---|----------|-----------|--------|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | None | None |

Appropriate engineering controls

Engineering measures to reduce exposure:

Ensure adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants

below the exposure limit.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

| | |
|----------------------------------|--|
| Eye protection: | Goggles |
| Skin and body protection: | Long sleeved clothing Chemical resistant apron Gloves |
| Respiratory protection: | Effective dust mask. Use a dust respirator under conditions where exposure to the substance is apparent (e.g. generation of high concentration of dust (dust clouds) , inadequate ventilation, development of respiratory tract irritation), and engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent. |
| Hygiene measures: | Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product When using, do not eat, drink or smoke. |

9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|--|---|--|
| Physical state: Solid | Appearance: Crystalline. Crystals. Crystalline powder. | Color: White. |
| Odor: Odorless. | Taste No information available. | Formula C4-H6-O5 |
| Molecular/Formula weight (g/mole): 134.09 | Flammability (solid, gas) no data available | Flashpoint (°C/°F): 203 °C/397.4 °F |
| Flash Point Tested according to: Not available | Autoignition Temperature (°C/°F): 340 °C/644 °F | Lower Explosion Limit (%): No information available |
| Upper Explosion Limit (%): No information available | Melting point/range(°C/°F): 128-133 °C/262.4-271.4 °F | Decomposition temperature(°C/°F): No information available |
| Boiling point/range(°C/°F): 150 °C/302 °F with decomposition | Bulk density: No information available | Density (g/cm3): 1.601 |
| Specific gravity: No information available | pH No information available | Vapor pressure @ 20°C (kPa): No information available |
| Evaporation rate: No information available | Vapor density: No information available | VOC content (g/L): No information available |
| Odor threshold (ppm): No information available | Partition coefficient (n-octanol/water): -1.26 | Viscosity: No information available |
| Miscibility: No information available | Solubility: Soluble in Water Soluble in Methanol Very slightly soluble in Ether Solubility in methanol @ 20 deg.: 82.70 g/100 g solvent Solubility in diethyl ether@ 20 deg. C: | |

0.84 g/100 g solvent
Solubility in ethanol @ 20 deg. C:
45.53 g/100 g solvent
Solubility in acetone @ 20 deg. C:
17.75 g/100 g solvent
Solubility in dioxane @ 20 deg. C:
22.70 g/100 g solvent
Solubility in water @ 20 deg. C: 55. 8
g/100 g solvent

10. STABILITY AND REACTIVITY

Reactivity

No information available

Chemical stability

Stability: Stable under recommended storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Heat. Incompatible materials. Ignition sources.

Incompatible Materials: Oxidizing agents
Bases
Amines
carbonates
Alkali Metals

Hazardous decomposition products: Carbon monoxide. Carbon dioxide.

Other Information

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:

Ingestion. Inhalation.

Acute Toxicity

Component Information

Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7)

| | |
|--------|----------|
| CAS No | 617-48-1 |
|--------|----------|

LD50/oral/rat = No information available

LD50/oral/mouse = 1600 mg/kg (RTECS)

>3200 mg/kg (HSDB)

LD50/dermal/rabbit = No information available

LD50/dermal/rat = No information available

LC50/inhalation/rat = No information available

LC50/inhalation/mouse = No information available
 Other LD50 or LC50 information = No information available

Product Information

LD50/oral/rat =
 Value - Acute Toxicity = No information available

LD50/oral/mouse =
 Value - Acute Tox = 1600 mg/kg

LD50/dermal/rabbit
 Value - Acute Toxicity = No information available

LD50/dermal/rat
 VALUE - Acute Tox = No information available

LC50/inhalation/rat
 VALUE-Vapor = No information available
 VALUE-Gas = No information available
 VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse
 VALUE-Vapor = No information available
 VALUE - Gas = No information available
 VALUE - Dust/Mist = No information available

Symptoms

Skin Contact: Causes skin irritation. Moderately to strongly irritating.
Eye Contact: Causes serious eye irritation. Causes moderate to severe eye irritation.
Inhalation May cause irritation of respiratory tract.
Ingestion Harmful if swallowed. Ingestion may cause nausea, vomiting, diarrhea. May cause weakness, respiratory distress, and cyanosis.
Aspiration hazard No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity No information available.

Sensitization: No information available.

Mutagenic Effects: No information available

Carcinogenic effects: Not considered carcinogenic.

| Component | CAS No | IARC | ACGIH - Carcinogens | NTP | OSHA HCS - Carcinogens | Australia - Notifiable Carcinogenic Substances | Australia - Prohibited Carcinogenic Substances |
|---|----------|------------|---------------------|------------|------------------------|--|--|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |

ACGIH (American Conference of Governmental Industrial Hygienists)

IARC (International Agency for Research on Cancer)

NTP (National Toxicology Program)

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

Reproductive toxicity No data is available

Reproductive Effects: No information available

Developmental Effects: No information available

Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Target Organs: No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Persistence and degradability: Readily biodegradable

Bioaccumulative potential: No information available.

Mobility in soil No information available

Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:

Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:

Empty containers should be taken for local recycling, recovery or waste disposal

| Component | CAS No | RCRA - F Series Wastes | RCRA - K Series Wastes | RCRA - P Series Wastes | RCRA - U Series Wastes |
|---|----------|------------------------|------------------------|------------------------|------------------------|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | None | None | None | None |

14. TRANSPORT INFORMATION

DOT

UN-No: Not Regulated

Proper Shipping Name: No information available

Hazard Class No information available

Subsidiary Class No information available

Packing group: No information available

Emergency Response Guide Number No information available
Marine Pollutant No data available
DOT RQ (lbs): No information available
Special Provisions No Information available
Symbol(s): No information available
Description: No information available

TDG (Canada)
UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class No information available
Subsidiary Risk: No information available
Packing Group: No information available
Marine Pollutant No Information available
Description: No information available

ADR
UN Number Not regulated
Proper Shipping Name: No information available
Transport hazard class(es) No information available
Packing group No information available
Subsidiary Risk: No information available

IMDG
UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Marine Pollutant No information available

RID
UN Number Not Regulated
Proper Shipping Name: No information available
Transport hazard class(es) No information available
Subsidiary Risk: No information available
Packing group No information available

ICAO (air)
UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class No information available
Subsidiary Risk: No information available
Packing Group: No information available

IATA
UN Number Not Regulated
Proper Shipping Name: No information available
Transport hazard class(es) No information available
Subsidiary Risk: No information available
Packing group No information available
Precautionary Statements - Response No information available
Special Provisions No information available

15. REGULATORY INFORMATION

International Inventories

| Component | CAS No | U.S. TSCA | KOREA KECL | Philippines (PICCS) | Japan ENCS | China IECSC | Australia (AICS) | EINECS-No. |
|---|----------|--|---|---|---|---|---|---|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | Not Listed (Cas number 617-48-1) Present (CAS number 6915-15-7) | Present KE-22994 (CAS number 617-48-1) Present KE-20414 (CAS number 6915-15-7) | Not Present (CAS number 617-48-1) Present (CAS number 6915-15-7) | Present (2)-1442 (For CAS number 617-48-1) Present (2)-1442 (For CAS number 6915-15-7) | Present [26140] (For CAS number 617-48-1) Present [26142] (For CAS number 6915-15-7) | Not Present (for CAS number 617-48-1) Present (For CAS number 6915-15-7) | Present 210-514-9 (For CAS number 617-48-1) Present 230-022-8 (For CAS number 6915-15-7) |

U.S. Regulations

Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7)

FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 184.1069

FDA - 21 CFR - Total Food Additives 184.1069

- List Sourced from EAFUS

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

| Component | CAS No | Carcinogen | Developmental Toxicity | Male Reproductive Toxicity | Female Reproductive Toxicity: |
|---|----------|------------|------------------------|----------------------------|-------------------------------|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | Not Listed | Not Listed | Not Listed | Not Listed |

CERCLA/SARA

| Component | CAS No | CERCLA - Hazardous Substances and their Reportable Quantities | Section 302 Extremely Hazardous Substances and TPQs | Section 302 Extremely Hazardous Substances and RQs | Section 313 - Chemical Category | Section 313 - Reporting de minimis |
|---|----------|---|---|--|---------------------------------|------------------------------------|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | None | None | None | None | None |

U.S. TSCA

| Component | CAS No | TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS) | TSCA 8(d) -Health and Safety Reporting |
|---|----------|---|--|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | Not Applicable | Not Applicable |

Canada

WHMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information:

The WHMIS 2015 classification of this product has not been validated or reviewed yet.

Canada Hazardous Products Regulation This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

DSL/NDSL

| Component | CAS No | Canada (DSL) | Canada (NDSL) |
|---|----------|--------------|---------------|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | Present | Not Listed |

| Component | CAS No | CEPA Schedule I - Toxic Substances |
|---|----------|---|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | Not listed |
| Component | CAS No | CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting |
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | Not listed |

EU Classification**EU GHS - SV - CLP 1272/2008**

| Component | CAS No | EU GHS - SV - CLP (1272/2008) |
|---|----------|-------------------------------|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | |

EU - CLP (1272/2008)**R-phrase(s)**

R22 - Harmful if swallowed

R36/38 - Irritating to eyes and skin

S -phrase(s)

S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

S46 - If swallowed, seek medical advice immediately and show this container or label

| Component | CAS No | Classification | Concentration Limits: | Safety Phrases |
|---|----------|----------------|-----------------------|----------------|
| Malic Acid (CAS number 617-48-1 and alternate CAS number 6915-15-7) | 617-48-1 | | No information | |

The product is classified in accordance with Annex VI to Directive 67/548/EEC**Indication of danger:**

Xn - Harmful

Xi - Irritant

Xn**Xi****16. OTHER INFORMATION**

Preparation Date: 8/5/2014
Revision date: 07/11/2019
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet