



# SAFETY DATA SHEET

## 1. CHEMICAL IDENTIFICATION AND COMPANY INFORMATION

PRODUCT NAME: L-Maleic Acid  
PRODUCT NUMBER: M471  
COMPANY INFO: *PhytoTechnology Laboratories*<sup>®</sup>  
PO Box 12205, Shawnee, KS 66282-2205  
Phone: 1-888-749-8682 or 1-913-341-5343; Fax: 1-888-449-8682 or 1-913-341-5442  
www.phytotechlab.com

EMERGENCY PHONE NUMBER: 1-800-535-5053 - US Only  
1-352-323-3500 - International

RECOMMENDED USE: For Research Use Only

RESTRICTIONS ON USE: Products sold by *PhytoTechnology Laboratories*<sup>®</sup> are intended for research and laboratory use only. Products are not to be used as human or animal therapeutics, cosmetics, agricultural or pesticidal products, food additives, or as household chemicals.

## 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification:

- H302 – Acute toxicity, Oral (Category 4)
- H315 – Skin irritation (Category 2)
- H317 – Skin sensitization (Category 1)
- H319 – Eye irritation (Category 2A)
- H335 – Specific target organ toxicity - single exposure – Respiratory System (Category 3)
- H402 – Acute aquatic toxicity (Category 3)

GHS Label elements, including hazard and precautionary statements:



Signal Word: **Warning**

Hazard Statements:

- H302 – Harmful if swallowed.
- H315 – Causes skin irritation.
- H317 – May cause an allergic skin reaction.
- H319 – Causes serious eye irritation.
- H335 – May cause respiratory irritation.
- H402 – Harmful to aquatic life.

Precautionary Statements:

- P261 – Avoid breathing dust.
- P273 – Avoid release to the environment.
- P280 – Wear protective gloves/protective clothing/eye protection/face protection.
- P304 + P340 + P312 – IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
- P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: cis-Butenedioic Acid, Toxillic acid  
CAS No.: 110-16-7  
Formula: C<sub>4</sub>H<sub>4</sub>O<sub>4</sub>  
Molecular Weight: 116.07 g/mol  
EC No.: 203-742-5

Ingredient	CAS Number	Percent	Hazardous
L-Maleic Acid	110-16-7	>98 %	No exposure limits established by OSHA or ACGIH

#### 4. FIRST AID MEASURES

General Advice: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

Route of Entry	Symptoms	First Aid Procedures
Ingestion	May cause irritation if swallowed	If swallowed, wash out mouth with water. Never give anything by mouth to an unconscious person. <b>Get medical attention.</b>
Inhalation	May cause irritation to respiratory tract	Safely remove victim to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure clear airway and give oxygen. <b>Get medical attention.</b>
Eye Contact	Direct contact may cause irritation. May cause redness, tearing, or blurred vision.	Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. <b>Get medical attention if irritation persists.</b>
Skin Contact	Irritating. May cause reddening, itching or inflammation.	Wash area thoroughly with soap and water. Remove and wash contaminated clothing. <b>Get medical attention if irritation persists.</b>

Most Important Symptoms or Effects, Both Acute and Delayed:

See section 2 and/or section 11

Recommendation for Immediate Medical Care and Special Treatment Needed:

No data available

#### 5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media:	Water spray, carbon dioxide, dry chemical powder, or appropriate foam. Use extinguishing media suitable for surrounding fire.
Special Protective Equipment and Precaution for Firefighters:	In the event of a fire, wear full protective clothing and NIOSH approved self-contained breathing apparatus. Evacuate the area and fight fire from a safe distance.
Hazardous Combustion Products:	May emit toxic fumes under fire conditions.
Toxic Gases Produced:	Carbon dioxide and carbon monoxide.

#### 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures:

Use personal protection recommended in Section 8. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation, especially in confined areas. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental Precautions:	Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
Method of Containment and Cleanup:	Wear suitable protective clothing. Avoid dust formation. Carefully sweep up and remove. Place material in a dry container and cover. Remove from the area. Flush spill area with water. Do not let products enter drains.

#### 7. HANDLING AND STORAGE

Precaution for Safe Handling:	Avoid contact with skin and eyes. Avoid dust formation and aerosols. Avoid incompatible substances. Wash thoroughly after use.
Conditions for Safe Storage:	Keep in a tightly closed container and store in a cool, dry, and well-ventilated area.
Incompatibilities:	Strong oxidizing agents
Recommended Storage Temperature:	Room Temperature

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OSHA's Permissible Exposure Limits (PELs): No data available

Threshold Limit Values (TLVs): No data available

Engineering Controls: Handle in accordance to general industrial hygiene and safety practice.

Personal Protective Equipment (PPE):

Eye/Face Protection: Chemical safety glasses or goggles. Have eye-washing facilities readily available where eye contact can occur.

Skin Protection: Protective gloves

Body Protection: Lab coat

Respiratory Protection: Appropriate dust mask. For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White to off-white powder

pH: No data available

Solubility: Soluble in Water

Melting Point: 137 - 140 °C (279 - 284 °F) - lit.

Vapor Density: No data available

Vapor Pressure: No data available

Odor: May have slight pungent odor

Odor Threshold: No data available

Viscosity: No data available

Relative Density: 1.59 g/cm<sup>3</sup> at 25 °C (77 °F)

Evaporation Rate: No data available

Initial Boiling Point and Boiling Range: 160 °C (320 °F)

Flammability (solid, gas): No data available

Partition coefficient: log Pow: -0.48  
n-octanol/water):

Auto-ignition Temperature: No data available

Decomposition Temperature: No data available

Flash Point (Closed Cup): 127 °C (261 °F)

Flammable Limits: Upper (%) – No data available Lower (%) – 2.7 % (V)

## 10. STABILITY AND REACTIVITY

Reactivity: No data available

Chemical Stability: Stable under normal conditions of use – May be slightly hygroscopic

Possibility of Hazard Reactions: Will not occur

Conditions to Avoid: Dust generation, moisture, ignition sources

Incompatibles Materials: Strong oxidizing agents

Hazardous Decomposition Products: Carbon dioxide, carbon monoxide

## 11. TOXICOLOGICAL INFORMATION

Toxicity: LD<sub>50</sub> (Oral-Rat)(mg/Kg): 708

LD<sub>50</sub> (Skin-Rabbit)(mg/Kg): 1560

LD<sub>50</sub> (Oral-Mouse)(mg/Kg): 2400

Carcinogenicity: NTP: No  
IARC: No  
Z List: No  
OSHA Reg: No

Reproductive Toxicity: No data available

Symptoms Associated with Overexposure: Irritation, itching, gastrointestinal upset, nausea, vomiting, headache, tremors, convulsions, muscle weakness, burns, possible mutagenic effects, eye damage, kidney impairment

Specific Target Organ Toxicity: Single Exposure: May cause respiratory irritation.  
Repeated Exposure: No data available

Target Organs: Eyes, kidneys

Medical Conditions Aggravated By Exposure: None identified

Routes of Entry: Ingestion, inhalation, skin and eye contact

NIOSH/RTECS NO: OM9625000

***The toxicological properties of this product have not been thoroughly investigated***

## 12. ECOLOGICAL INFORMATION

Ecotoxicity: Toxicity to fish - LC50 - Oncorhynchus mykiss (rainbow trout) - 75 mg/l - 96 h  
Remarks: Read-across (Analogy)  
Toxicity to daphnia - EC50 - Daphnia magna (Water flea) - 42.81 mg/l - 48 h  
NOEC - Daphnia magna (Water flea) - 17.5 mg/l - 48 h  
Toxicity to algae - EC50 - Desmodesmus subspicatus (green algae) - 41 mg/l - 72 h

Persistence and Degradability: 97% Readily biodegradable

Bioaccumulative Potential: Bioconcentration factor (BCF): < 10

Mobility in Soil: No data available

Other Adverse Effects: Harmful to aquatic life.

## 13. DISPOSAL CONSIDERATION

Disposal Procedure: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA Hazardous Waste Number: No data available

## 14. TRANSPORT INFORMATION

Domestic (D.O.T.): Proper Shipping Name: CHEMICALS, N.O.S. (NON-REGULATED)  
Hazard Class: N/A  
UN/NA: N/A  
Labels: N/A

International:

IMDG: Proper Shipping Name: CHEMICALS, N.O.S. (NON-REGULATED)  
Hazard Class: N/A  
UN/NA: N/A  
Labels: N/A

IATA: Proper Shipping Name: CHEMICALS, N.O.S. (NON-REGULATED)  
 Hazard Class: N/A  
 UN/NA: N/A  
 Labels: N/A

**15. REGULATORY INFORMATION**

TSCA: Yes

SARA TITLE III:

Section 302 (EHS) Ingredients: No  
 Section 313 Ingredients: No  
 Section 304 (EHS/CERCLA) Ingredients: No  
 Section 311/312 Hazard: No SARA Hazards

Massachusetts Right to Know Components: CAS No.: 110-16-7 Maleic Acid

Pennsylvania Right to Know Components: CAS No.: 110-16-7 Maleic Acid

New Jersey Right to Know Components: CAS No.: 110-16-7 Maleic Acid

California Prop. 65 Components: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

**16. OTHER INFORMATION**

HMIS Rating:	<b>Health Hazard</b>	<b>Chronic Health Hazard</b>	<b>Flammability</b>	<b>Physical Hazard</b>
	2		0	0
NFPA Rating:	<b>Health Hazard</b>	<b>Fire Hazard</b>	<b>Reactivity Hazard</b>	<b>Special Hazard</b>
	2	0	0	

***PhytoTechnology Laboratories®* provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. The above information is intended to be used only as a guide to the appropriate precautionary handling of this material by a properly trained person. *PhytoTechnology Laboratories®* shall not be held liable for any damage resulting from handling or from contact with the above product. This product is intended for LABORATORY USE ONLY. Our products may NOT BE USED as drugs, cosmetics, agricultural or pesticidal products, food additives or as household chemicals.**

Revision Date: 18 May 15