

# Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	<p>Corrosive to eyes and skin on contact. Harmful compound, minimize exposure.</p>	

## Section I. Chemical Product and Company Identification

Chemical Name	<b>Maleic Acid</b>		
Catalog Number	M0006	Supplier	TCI America 9211 N. Harbortgate St. Portland OR 1-800-423-8616
Synonym	cis-2-Butenedioic Acid		
Chemical Formula	(:CHCOOH) <sub>2</sub>		
CAS Number	110-16-7	In case of Emergency Call	<b>Chemtrec®</b> <b>(800) 424-9300 (U.S.)</b> <b>(703) 527-3887 (International)</b>

## Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Maleic Acid	110-16-7	Min. 99.0 (T)	Not available.	Rat LD <sub>50</sub> (oral) 708 mg/kg Rat LC <sub>50</sub> (inhalation) >720 mg/m <sup>3</sup> Rabbit LD <sub>50</sub> (dermal) 1560 mg/kg

## Section III. Hazards Identification

Acute Health Effects	Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Harmful if ingested or inhaled. Minimize exposure to this material. May cause gastrointestinal disturbances. Severe overexposure can result in injury or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
Chronic Health Effects	<p><b>CARCINOGENIC EFFECTS</b> : Not available.</p> <p><b>MUTAGENIC EFFECTS</b> :</p> <p>DNA inhibition: Human (fibroblast) 20 mmol/L</p> <p><b>TERATOGENIC EFFECTS</b> : Not available.</p> <p>Toxicity to the reproductive system: Not available. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.</p>

## Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. DO NOT use an eye ointment. Flush eyes with running water for a minimum of 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention. Treat symptomatically and supportively.
Skin Contact	If the chemical gets spilled on a clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical touches the victim's exposed skin, such as the hands: Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Seek medical attention. Treat symptomatically and supportively. Wash any contaminated clothing before reusing.
Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform artificial respiration. WARNING: It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.
Ingestion	DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt, or waistband. If the victim is not breathing, administer artificial respiration. Have conscious person drink several glasses of water or milk. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.

## Section V. Fire and Explosion Data

Flammability	Combustible.	Auto-Ignition	Not available.
Flash Points	Not available.	Flammable Limits	Not available.
Combustion Products	These products are toxic carbon oxides (CO, CO <sub>2</sub> ).		
Fire Hazards	No specific information is available regarding the flammability of this compound in the presence of various materials.		
Explosion Hazards	<p>Risks of explosion of the product in presence of mechanical impact: Not available.</p> <p>Risks of explosion of the product in presence of static discharge: Not available.</p> <p>No additional information is available regarding the risks of explosion.</p>		

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Emergency phone number (800) 424-9300

Fire Fighting Media  
and Instructions

SMALL FIRE: Use DRY chemicals, CO<sub>2</sub>, water spray or foam.  
LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.

## Section VI. Accidental Release Measures

Spill Cleanup  
Instructions

Corrosive solid.  
Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal.

## Section VII. Handling and Storage

Handling and Storage  
Information

CORROSIVE. HARMFUL. Keep container dry. Keep away from heat and sources of ignition. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT breathe dust. Avoid contact with eyes. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Treat symptomatically and supportively.  
Always store away from incompatible compounds such as oxidizing agents, reducing agents, and bases.

## Section VIII. Exposure Controls/Personal Protection

Engineering Controls

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.

Personal Protection

Faceshield. Lab coat. Vapor and dust respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.



Exposure Limits

Not available.

## Section IX. Physical and Chemical Properties

Physical state @ 20°C	White powder.	Solubility	Easily soluble in methanol. Soluble in acetone. Partially soluble in diethyl ether. 788 g/L water @ 25°C, 3926 g/L water @ 97.5°C.
Specific Gravity	1.59 (water=1)	Partition Coefficient	Not available.
Molecular Weight	116.07	Vapor Pressure	Not available.
Boiling Point	Not available.	Vapor Density	4 (Air = 1)
Melting Point	136 to 139°C (276.8 to 282.2°F)	Volatility	Not available.
Refractive Index	Not available.	Odor	Faint, acidulous.
Critical Temperature	Not available.	Taste	Not available.
Viscosity	Not available.		

## Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light.
Incompatibilities	Reactive with strong oxidizing agents, reducing agents, and bases.

## Section XI. Toxicological Information

RTECS Number	OM9625000
Routes of Exposure	Eye contact. Ingestion. Inhalation. Skin contact.
Toxicity Data	Rat LD <sub>50</sub> (oral) 708 mg/kg Rat LC <sub>50</sub> (inhalation) >720 mg/m <sup>3</sup> /1H Rabbit LD <sub>50</sub> (dermal) 1560 mg/kg
Chronic Toxic Effects	<b>CARCINOGENIC EFFECTS</b> : Not available. <b>MUTAGENIC EFFECTS</b> : DNA inhibition: Human (fibroblast) 20 mmol/L <b>TERATOGENIC EFFECTS</b> : Not available. Toxicity to the reproductive system: Not available. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.
Acute Toxic Effects	Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Harmful if ingested or inhaled. Minimize exposure to this material. May cause gastrointestinal disturbances. Severe overexposure can result in injury or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

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**Section XII. Ecological Information**

Ecotoxicity Not available.

Environmental Fate Maleic acid may be released into waste water during its production and use in the manufacture of polymer products. Maleic acid is also released into the atmosphere from motor exhaust and is a constituent of aerosols in urban air. If released on land, maleic acid will leach into the ground and probably biodegrade. If released into water, maleic acid will also probably biodegrade. Adsorption to sediment, bioconcentration in aquatic organisms, and volatilization should not be significant. It will be primarily associated with aerosols in the atmosphere and be subject to gravitational settling and degradation by reaction with ozone and photochemically produced hydroxyl radicals (vapor phase half-life 1.1 hr). The general population is exposed to maleic acid in areas with heavy traffic since it is found in aerosols from auto exhaust. Occupational exposure would be via dermal contact and inhalation of aerosols containing maleic acid. (SRC) \*\*PEER REVIEWED\*\*  
(Excerpted from Hazardous Substances Data Bank, 1997)

**Section XIII. Disposal Considerations**

Waste Disposal Recycle to process, if possible. Consult your local or regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state, and local regulations when disposing of this substance.

**Section XIV. Transport Information**

DOT Classification DOT CLASS 8: Corrosive solid.

PIN Number UN3261

Proper Shipping Name Corrosive solid, acidic, organic, n.o.s.

Packing Group (PG) III

DOT Pictograms

**Section XV. Other Regulatory Information and Pictograms**

TSCA Chemical Inventory (EPA) This product is **ON** the EPA Toxic Substances Control Act (TSCA) inventory.

WHMIS Classification (Canada) WHMIS CLASS E: Corrosive solid.

EINECS Number (EEC) 203-742-5

EEC Risk Statements  
R35- Causes severe burns.  
R41- Risk of serious damage to eyes.  
R21/22- Harmful in contact with skin and if swallowed.

Japanese Regulatory Data Not available.

**Section XVI. Other Information**

**Version 1.0**  
**Validated on 5/14/2009.**  
**Printed 5/14/2009.**

**Notice to Reader**

TCl laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.