TCI AMERICA

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	**Irritating to skin, eyes, and the respiratory system.**	

Section I. Chemical Product and Company Identification

Chemical Name: **Succinic Acid**

Catalog Number: S0100

Synonym: Butanedioic Acid

Chemical Formula: $C_4H_6O_4$

CAS Number: 110-15-6

Supplier: TCI America
9211 N. Harborgate St.
Portland OR
1-800-423-8616

In case of Emergency Call: **Chemtrec®**
(800) 424-9300 (U.S.)
(703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Succinic Acid	110-15-6	Min. 99.0 (T)	Not available.	Rat LD_{50} (oral) 2260 mg/kg Mouse LD_{50} (intraperitoneal) 2702 mg/kg Mouse LD_{50} (intravenous) 1400 mg/kg

Section III. Hazards Identification

Acute Health Effects

Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Chronic Health Effects

CARCINOGENIC EFFECTS : Not available.
MUTAGENIC EFFECTS : Not available.
TERATOGENIC EFFECTS : Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.

Section IV. First Aid Measures

Eye Contact

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact

In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Inhalation

If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.

Ingestion

INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

Section V. Fire and Explosion Data

Flammability: May be combustible at high temperature.

Auto-Ignition: Not available.

Flash Points: 206℃ (402.8℉).

Flammable Limits: Not available.

Combustion Products

These products are toxic carbon oxides (CO, CO_2).

Fire Hazards

Not available.

Explosion Hazards

Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions

SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.
Consult with local fire authorities before attempting large scale fire-fighting operations.

Continued on Next Page

Section VI. Accidental Release Measures

Spill Cleanup Instructions

Irritating material.
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning the spill by rinsing any contaminated surfaces with copious amounts of water. Consult federal, state, and/or local authorities for assistance on disposal.

Section VII. Handling and Storage

Handling and Storage Information

IRRITANT. Keep away from heat. 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.
Always store away from incompatible compounds such as oxidizing agents, reducing agents, alkalis (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

Splash goggles. Lab coat. Dust respirator. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. Be sure to use a MSHA/NIOSH approved respirator or equivalent.

Exposure Limits

Not available.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Solid. (White powder~crystal)	Solubility	1g soluble in: 13mL Cold water, 1mL in Boiling water, 18.5mL Alcohol, 6.3mL Methanol, 36mL Acetone, 20mL Glycerol, 113mL Ether. Insoluble in Toluene, Benzene, Carbon disulfide, Carbon tetrachloride, Petroleum ether.
Specific Gravity	1.56 (water=1)		
Molecular Weight	118.09	Partition Coefficient	Log P_{ow} -0.59
Boiling Point	235°C (455°F)	Vapor Pressure	Not applicable.
Melting Point	188°C (370.4°F) (decomp.)	Vapor Density	Not available.
Refractive Index	Not available.	Volatility	Not available.
Critical Temperature	Not available.	Odor	Not available.
Viscosity	Not available.	Taste	acid taste (Strong.)

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 oxidizing agents, reducing agents, alkalis (bases).

Section XI. Toxicological Information

RTECS Number

WM4900000

Routes of Exposure

Eye Contact. Ingestion. Inhalation.

Toxicity Data

Rat LD_{50} (oral) 2260 mg/kg
Mouse LD_{50} (intraperitoneal) 2702 mg/kg
Mouse LD_{50} (intravenous) 1400 mg/kg

Chronic Toxic Effects

CARCINOGENIC EFFECTS : Not available.
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TERATOGENIC EFFECTS : Not available.
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Acute Toxic Effects

Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Continued on Next Page

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Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	Succinic acid's production and use in the manufacture of lacquers, dyes, esters for perfumes, in photography, and in foods as a sequestrant, buffer and neutralizing agent may result in its release to the environment through various waste streams. Succinic acid is a constituent of almost all plant and animal tissues as it is a normal intermediary metabolite, being a component of the Kreb's Cycle. If released into the atmosphere, succinic acid is expected to exist in both the particulate and vapor phases in the ambient atmosphere based on an extrapolated vapor pressure of 1.91X10-7 mm Hg at 25 deg C. Vapor-phase succinic acid will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals with an estimated half-life of about 6 days. Particulate-phase succinic acid will be physically removed from the atmosphere by wet and dry deposition. If released to soil, an estimated Koc of 11 indicates that succinic acid is expected to have very high mobility in soil. Volatilization from dry and wet soil surfaces is not expected to occur based on this compound's extrapolated vapor pressure and an estimated Henry's Law constant of 3.6X10-13 atm-cu m/mole at 25 deg C, respectively. Biodegradation of succinic acid in both soil and water is expected to be an important fate process based on a theoretical BOD of 78% measured using the MITI test. If released into water, succinic acid is not expected to adsorb to suspended solids and sediments in the water column based on its estimated Koc. The potential for bioconcentration of succinic acid in aquatic organisms is low based on an estimated BCF of Volatilization from water surfaces is not expected to be important based on pKas of 4.16 and 5.6 (anions do not volatilize) and the estimated Henry's Law constant of the free acid.Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions. Occupational exposure to succinic acid may occur through inhalation and dermal contact with this compound at workplaces where succinic acid is produced or used. Monitoring data indicate that the general population may be exposed to succinic acid via inhalation of ambient air, ingestion of food and drinking water, and dermal contact with consumer products containing succinic acid. (SRC) [Peer Reviewed]

Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local 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 the substance.

Section XIV. Transport Information

DOT Classification	Not a DOT controlled material (United States).
PIN Number	Not applicable.
Proper Shipping Name	Not applicable.
Packing Group (PG)	Not applicable.
DOT Pictograms	

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is **ON** the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	On DSL.
EINECS Number (EEC)	203-740-4
EEC Risk Statements	R36/37/38- Irritating to eyes, respiratory system and skin.
Japanese Regulatory Data	ENCS No. 2-846

Section XVI. Other Information

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Validated on 4/14/2009.
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Notice to Reader

TCI 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.