

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	POSSIBLE CARCINOGEN. MINIMIZE EXPOSURE. Hygroscopic -- keep container tightly sealed. Store under inert gas.	

Section I. Chemical Product and Company Identification

Chemical Name	Shikimic Acid		
Catalog Number	S0038	Supplier	TCI America 9211 N. Harborsgate St. Portland OR 1-800-423-8616
Synonym	3,4,5-Trihydroxy-1-cyclohexene-1-carboxylic Acid		
Chemical Formula	C ₇ H ₁₀ O ₅		
CAS Number	138-59-0	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
Shikimic Acid	138-59-0	Min. 97.0 (T)	This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen.	Mouse LD ₅₀ (intraperitoneal) 1000 mg/kg

Section III. Hazards Identification

Acute Health Effects	No specific information is available in our data base regarding the toxic effects of this material for humans. However, exposure to any chemical should be kept to a minimum. Skin and eye contact may result in irritation. May be harmful if inhaled or ingested. Always follow safe industrial hygiene practices and wear proper protective equipment when handling this compound.
Chronic Health Effects	CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic effects. Mouse TDLo intraperitoneal 40 mg/kg TOXIC EFFECTS: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Gastrointestinal - Tumors Mouse TDLo Oral 4000 mg/kg TOXIC EFFECTS: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Gastrointestinal - Tumors 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	Not available.	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.		

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Emergency phone number (800) 424-9300

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.

Section VI. Accidental Release MeasuresSpill Cleanup
Instructions

Possibly carcinogenic material. Hygroscopic 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 StorageHandling and Storage
Information

POSSIBLE CARCINOGEN. HYGROSCOPIC. STORE UNDER INERT GAS. 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, moisture.

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. Boots. 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

This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Solid. (Off-white powder.)	Solubility	Soluble in water, alcohol, ether. Practically insoluble in chloroform, benzene, petroleum ether.
Specific Gravity	Not available.		
Molecular Weight	174.15	Partition Coefficient	Not available.
Boiling Point	Not available.	Vapor Pressure	Not applicable.
Melting Point	185°C (365°F)	Vapor Density	Not available.
Refractive Index	Not available.	Volatility	Not available.
Critical Temperature	Not available.	Odor	Not available.
Viscosity	Not available.	Taste	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. Hygroscopic; keep container tightly closed. Store under inert gas.
Incompatibilities	Reactive with oxidizing agents, moisture.

Section XI. Toxicological Information

RTECS Number	GW4600000
Routes of Exposure	Eye Contact. Ingestion. Inhalation.
Toxicity Data	Mouse LD ₅₀ (intraperitoneal) 1000 mg/kg
Chronic Toxic Effects	<p>CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic effects. Mouse TDLo intraperitoneal 40 mg/kg TOXIC EFFECTS: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Gastrointestinal - Tumors Mouse TDLo Oral 4000 mg/kg TOXIC EFFECTS: Tumorigenic - Equivocal tumorigenic agent by RTECS criteria Gastrointestinal - Tumors DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.</p>
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Section XII. Ecological Information

Ecotoxicity Not available.

Environmental Fate Shikimic acid's production and use as active component in the flotation reagent Quebracho and its presence in bracken fern (*Pteridium aquilinum*) may result in its release to the environment. If released into the atmosphere, shikimic acid will exist predominantly in the particulate phase the ambient atmosphere, based on an estimated vapor pressure of 5.0×10^{-9} mm Hg at 25 deg C. Vapor phase shikimic acid is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals with a half-life of about 6.3 hours. An estimated Koc value of 6 suggests that shikimic acid will have very high mobility in soil. Volatilization from moist soil is not expected based upon an estimated Henry's Law constant of 2.7×10^{-14} atm-cu m/mole. Volatilization from dry soil surfaces should not be important given the vapor pressure of this compound. Under anaerobic conditions, microorganisms from the genera *Pseudomonas*, *Flavobacterium*, *Achromobacter*, and *Xanthomonas* aerobically degraded shikimic acid with an oxygen uptake of approximately 150 μ l after 120 minutes. In water, shikimic acid is not expected to adsorb to sediment or particulate matter based on its Koc value. This compound is not expected to volatilize from water surfaces given its estimated Henry's Law constant. Bioconcentration in aquatic organisms should be low based upon an estimated BCF value of 0.74. Given the commercial uses of shikimic acid, human exposure appears to be likely from occupational situations through dermal routes. The general population may be exposed to shikimic acid via ingestion of food and drinking water and other products containing shikimic acid.

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 product is **NOT** on the EPA Toxic Substances Control Act (TSCA) inventory. The following notices are required by 40 CFR 720.36 (C) for those products not on the inventory list:
 (i) These products are supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR 720.0 et sec.
 (ii) The health risks of these products have not been fully determined. Any information that is or becomes available will be supplied on an MSDS sheet.

WHMIS Classification (Canada) Not available.

EINECS Number (EEC) 205-334-2

EEC Risk Statements R45- May cause cancer.

Japanese Regulatory Data ENCS No. 3-4476; 3-4491

Section XVI. Other Information

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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.