









Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
   	<p>Highly toxic; do not ingest or inhale. Irritating to skin, eyes, and the respiratory system. Environmental hazard. This material is very toxic to aquatic organisms and may cause long term adverse effects to the aquatic environment. CARCINOGEN. MINIMIZE EXPOSURE. Readily absorbed through skin. Refrigerate.</p>	   

Section I. Chemical Product and Company Identification

Chemical Name	1,2,3,4,5,6-Hexachlorocyclohexane (gamma-Isomer)		
Catalog Number	H0056	Supplier	TCI America 9211 N. Harbortgate St. Portland OR 1-800-423-8616
Synonym	gamma-Benzene Hexachloride		
Chemical Formula	C ₆ H ₆ Cl ₆		
CAS Number	58-89-9	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
1,2,3,4,5,6-Hexachlorocyclohexane (gamma-Isomer)	58-89-9	Min. 99.0 (GC)	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen.	Rat LD ₅₀ (oral) 76 mg/kg Rat LD ₅₀ (intraperitoneal) 35 mg/kg Rabbit LD ₅₀ (dermal) 50 mg/kg

Section III. Hazards Identification

Acute Health Effects	<p>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.</p> <p>Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death.</p> <p>Readily absorbed through skin.</p> <p>Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>
Chronic Health Effects	<p>CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic Effects. Rat TDLo Oral 3780 mg/kg/80 weeks continuous. TOXIC Effects: Tumorigenic – Carcinogenic by RTECS criteria. Tumorigenic – Tumor types after systemic administration not seen spontaneously. Mouse TD Oral 25 gm/kg/73 weeks continuous. TOXIC Effects: Tumorigenic – Neoplastic by RTECS criteria. Lung, Thorax, or Respiration – Tumors. Liver – Tumors. Mouse TDLo Oral 10752 mg/kg/80 weeks continuous. TOXIC Effects: Tumorigenic – Carcinogenic by RTECS criteria. Blood – Tumors. DEVELOPMENTAL TOXICITY : Reproductive Effects. Man TDLo Oral 124 mg/kg female multigeneration. TOXIC Effects: Effects on Fertility – Abortion. Effects on Newborn – Live birth index. Effects on Newborn – Delayed effects. Rat TDLo Oral 100 mg/kg female 9 days of pregnancy. TOXIC Effects: Effects on Embryo or Fetus – Fetotoxicity. Mouse TDLo Oral 120 mg/kg female 9–16 days of pregnancy. TOXIC Effects: Specific Developmental Abnormalities – Endocrine system. Specific Developmental Abnormalities – Urogenital system. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.</p>

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Emergency phone number (800) 424-9300

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 for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
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), halogenated compounds. WARNING: Highly toxic HCl gas is produced during combustion.		
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.		


Section VI. Accidental Release Measures

Spill Cleanup Instructions	Highly toxic material. Irritating material. Environmentally hazardous material. Carcinogenic material. Readily absorbed through skin. 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.
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Section VII. Handling and Storage

Handling and Storage Information	HIGHLY TOXIC. IRRITANT. ENVIRONMENTAL HAZARD. CARCINOGENIC. READILY ABSORBED THROUGH SKIN. REFRIGERATE. Keep locked up. 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 ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents, metals, alkalis (bases).
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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. 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	This chemical is classified as a carcinogen. There is no acceptable exposure limit for a carcinogen.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Solid. (White Crystalline Powder-Powder.)	Solubility	Soluble in ethyl alcohol and ethyl ether. Soluble in g/100g @ 20°C: acetone 43.5, benzene 28.9, CHCl ₃ 24.0, ether 20.8, ethanol 6.4. Insoluble in water.
Specific Gravity	1.87 (water=1)	Partition Coefficient	Log P _{ow} : 3.61-3.72
Molecular Weight	290.83	Vapor Pressure	0.5 mmHg @ 60°C
Boiling Point	323°C (613.4°F)	Vapor Density	Not available.
Melting Point	113 to 115°C (235.4 to 239°F)	Volatility	Not available.
Refractive Index	1.644	Odor	Not available.
Critical Temperature	Not available.	Taste	Not available.
Viscosity	Not available.		

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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, metals, alkalis (bases).

Section XI. Toxicological Information

RTECS Number	CV4900000
Routes of Exposure	Eye Contact. Ingestion. Inhalation.
Toxicity Data	Rat LD ₅₀ (oral) 76 mg/kg Rat LD ₅₀ (intraperitoneal) 35 mg/kg Rabbit LD ₅₀ (dermal) 50 mg/kg
Chronic Toxic Effects	CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Tumorigenic Effects. Rat TDLo Oral 3780 mg/kg/80 weeks continuous. TOXIC Effects: Tumorigenic – Carcinogenic by RTECS criteria. Tumorigenic – Tumor types after systemic administration not seen spontaneously. Mouse TD Oral 25 gm/kg/73 weeks continuous. TOXIC Effects: Tumorigenic – Neoplastic by RTECS criteria. Lung, Thorax, or Respiration – Tumors. Liver – Tumors. Mouse TDLo Oral 10752 mg/kg/80 weeks continuous. TOXIC Effects: Tumorigenic – Carcinogenic by RTECS criteria. Blood – Tumors. DEVELOPMENTAL TOXICITY : Reproductive Effects. Man TDLo Oral 124 mg/kg female multigeneration. TOXIC Effects: Effects on Fertility – Abortion. Effects on Newborn – Live birth index. Effects on Newborn – Delayed effects. Rat TDLo Oral 100 mg/kg female 9 days of pregnancy. TOXIC Effects: Effects on Embryo or Fetus – Fetotoxicity. Mouse TDLo Oral 120 mg/kg female 9–16 days of pregnancy. TOXIC Effects: Specific Developmental Abnormalities – Endocrine system. Specific Developmental Abnormalities – Urogenital system. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
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. Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Readily absorbed through skin. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	Not available.

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.
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Section XIV. Transport Information

DOT Classification	DOT Class 6.1: Toxic material.
PIN Number	UN2761 RQ: 10(4.54)
Proper Shipping Name	Organochlorine pesticides, solid, toxic
Packing Group (PG)	II

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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)	CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). On DSL.
EINECS Number (EEC)	200-401-2
EEC Risk Statements	R26/27/28- Very toxic by inhalation, in contact with skin and if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin. R45- May cause cancer. R50- Very toxic to aquatic organisms. R53- May cause long-term adverse effects in the aquatic environment.
Japanese Regulatory Data	ENCS No. (3)-2250, (9)-1652

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.

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