

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
  	Toxic, do not ingest or inhale. Irritant and possible sensitizer. DANGEROUS MAY CAUSE CANCER.	   

Section I. Chemical Product and Company Identification

Chemical Name	4,4'-Diaminodiphenylmethane		
Catalog Number	M0220	Supplier	TCI America 9211 N. Harborside St. Portland OR 1-800-423-8616
Synonym	4,4'-Methylenedianiline; 4,4'-Methylenebis Benzenamine		
Chemical Formula	NH ₂ C ₆ H ₄ CH ₂ C ₆ H ₄ NH ₂		
CAS Number	101-77-9	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
4,4'-Diaminodiphenylmethane	101-77-9	Min. 98.0 (T)	This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen.	Man TDLo (oral) 8420 µg/kg Rat LD ₅₀ (oral) 662 mg/kg Rat LD ₅₀ (subcutaneous) 200 mg/kg Rat LD ₅₀ (intraperitoneal) 193 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. Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Skin contact may result in sensitization. Always cover all exposed skin with an impermeable layer and use proper eye protection. A OSHA/MSHA approved dust and vapor respirator is required when working with this material. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.
Chronic Health Effects	CARCINOGENIC EFFECTS : Equivocal tumorigenic agent by RTECS. Listed as class A2 (suspected human carcinogen) by ACGIH, as group 2B (possibly carcinogenic to humans) by IARC. Tumorigenic data: Rat (oral) 320 mg/kg/l. Caused tumors in liver. Rat (subcutaneous) 1410 mg/kg/l. Caused tumors in liver. MUTAGENIC EFFECTS : Suspected mutagen. DNA damage: Rat (intraperitoneal) 370 µmol/kg Unscheduled DNA synth: Rat (liver) 10 µmol/L Mutations: Bacteria (S typhimurium) 250 µg/plate (+S9), 50 µg/plate (-S9) TERATOGENIC EFFECTS : Not available. Toxicity to the reproductive system: Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs. MDA can cause liver damage in humans. In addition, such aromatic amines are recognized as carcinogens to the human bladder, ureter, and renal pelvis, and suspected carcinogens to the intestines, liver, lung, and prostate.

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. Cover the irritated skin with an emollient. Seek medical attention. Treat symptomatically and supportively. Wash any contaminated clothing before reusing.
Inhalation	If the victim is not breathing, perform artificial respiration. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention. Treat symptomatically and supportively.
Ingestion	Remove dentures if any. Have conscious person drink several glasses of water or milk. INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. NEVER give an unconscious person anything to ingest. Seek medical attention. Treat symptomatically and supportively.

Section V. Fire and Explosion Data			
Flammability	Combustible.	Auto-Ignition	>500°C (932°F)
Flash Points	220°C (428°F)	Flammable Limits	Not available.
Combustion Products	These products are toxic carbon oxides (CO, CO ₂), nitrogen oxides (NO, NO ₂).		
Fire Hazards	No specific information is available regarding the flammability of this compound in the presence of various materials.		
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. No additional information is available regarding the risks of explosion.		
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO ₂ , 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	Toxic 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. Finish cleaning the spill by rinsing any contaminated surfaces with copious amounts of water.

Section VII. Handling and Storage	
Handling and Storage Information	TOXIC. IRRITANT. SENSITIZER. Handle with caution and minimize exposure. 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 ingest. DO NOT breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Avoid contact with skin and eyes. Always store away from incompatible compounds such as oxidizing agents.

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 should 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 possible carcinogen. There is no acceptable exposure limit for a carcinogen.

Section IX. Physical and Chemical Properties			
Physical state @ 20°C	Off-white flakes.	Solubility	Easily soluble in methanol, diethyl ether. Soluble in acetone. Insoluble in cold water, hot water.
Specific Gravity	1.056 (Water = 1)	Partition Coefficient	Not available.
Molecular Weight	198.27	Vapor Pressure	1 mm of Hg (@ 197°C)
Boiling Point	398-399°C @ 768mmHg	Vapor Density	6.8 (Air = 1)
Melting Point	91°C (195.8°F)	Volatility	Not available.
Refractive Index	Not available.	Odor	Amine like. (Slight.)
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.

Section XI. Toxicological Information

RTECS Number	BY5425000
Routes of Exposure	Ingestion. Inhalation. Eye contact. Skin contact.
Toxicity Data	Man TDLo (oral) 8420 µg/kg Rat LD ₅₀ (oral) 662 mg/kg Rat LD ₅₀ (subcutaneous) 200 mg/kg Rat LD ₅₀ (intraperitoneal) 193 mg/kg
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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 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.
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Section XIV. Transport Information

DOT Classification	DOT CLASS 6.1: Toxic material.
PIN Number	UN2651
Proper Shipping Name	4,4'-Diaminodiphenyl methane
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 D-1B: Material causing immediate and serious toxic effects (TOXIC). WHMIS CLASS D-2B: Material causing other toxic effects (TOXIC).
EINECS Number (EEC)	202-974-4
EEC Risk Statements	R22- Harmful if ingested. R36/38- Irritating to eyes and skin.
Japanese Regulatory Data	Not available.

Section XVI. Other Information**Version 1.0****Validated on 2/4/2000.****Printed 3/1/2005.****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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