FYI-0794-000940

(A)

Chemical: N,N'Dimethylcylohexylamine (DMCHA), CAS #98-94-2

Processing:

Deleted

! Confidential
! Business
! Information

Prime Application:

Environmental Release:

200-250 lbs/yr to atmosphere
950-1000 lbs/yr to plant wastewater treatment facility

84940000040

Employee Exposure: Total number of workers exposed = 29

Exposure Level: 5 mg/m^3 8-hr TWA
Exposure Duration: 0.8 man days/yr, cumulative exposure

FYI-94-000940
INIT 07/26/94

Exposure Control:

- Neoprene gloves, apron and monogoggles worn to minimize skin and eye contact.
- Present in fuels at 10-15 ppm. DMCHA incinerated during use (fuel combustion) - no discharge to atmosphere.

Attachments:

- Du Pont Haskell Laboratory Toxicity Summary.
- Material Safety Data Sheet

KDDASTUR
1/30/84

9/25/95

U.S. DEPARTMENT OF LABOR
Occupational Safety & Health Administration
MATERIAL SAFETY DATA SHEET

SECTION I

MANUFACTURER'S NAME E. I. du Pont de Nemours & Co., Inc.	EMERGENCY TELEPHONE NO. (302) 774-1000
ADDRESS (Number, Street, City, State, and ZIP Code) 10th & Market Streets, Wilmington, Delaware 19898	
CHEMICAL NAME AND SYNONYMS N, N dimethyl cyclohexyl amine	TRADE NAME AND SYNONYMS DMCHA
CHEMICAL FAMILY Organic amine	FORMULA $C_8H_{17}N$

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES DMCHA	100	NA	OTHERS None		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
None		

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	320	SPECIFIC GRAVITY (H_2O=1)	0.85
VAPOR PRESSURE (mm Hg.) @ 100F	7.7	PERCENT VOLATILE BY VOLUME (%)	unknown
VAPOR DENSITY (AIR=1)	Unknown	EVAPORATION RATE (ether =1)	<1
SOLUBILITY IN WATER	Slight		
APPEARANCE AND ODOR Clear liquid with amine odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) TCC 104°F	FLAMMABLE LIMITS Unknown	Lel	Uel
EXTINGUISHING MEDIA CO_2 dry powder, foam or water spray			
SPECIAL FIRE FIGHTING PROCEDURES None			
UNUSUAL FIRE AND EXPLOSION HAZARDS Combustible Liquid			

RVD:par 3/22/78 Rev. 2/1/84

NOTICE FROM DU PONT

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Unknown

EFFECTS OF OVEREXPOSURE
DMCHA is corrosive to skin by DOT tests. Moderate acute oral toxicity to rats (oral LD50 200-400 mg/kg). Slightly toxic to guinea pigs (skin LD50 8600-17,200mg/kg).

EMERGENCY AND FIRST AID PROCEDURES
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse. In case of accidental ingestion, do not induce vomiting. Call a physician.

SECTION VI REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	None known

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Soak up spills with sand or earth

WASTE DISPOSAL METHOD

Burn in accordance with Federal, State and Local regulations.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*

VENTILATION	LOCAL EXHAUST	SPECIAL
	Good ventilation	
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Rubber	Goggles

OTHER PROTECTIVE EQUIPMENT
Face shield

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep away from heat and flames. Do not get in eyes on skin or clothing. Avoid breathing vapor. Keep container closed. Wash thoroughly after handling.

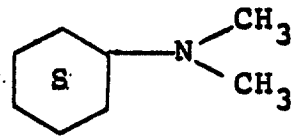
OTHER PRECAUTIONS

~~LIMITED DISTRIBUTION~~

This review reflects the available toxicity literature, both published and unpublished. Studies have not been evaluated for scientific merit.

HASKELL LABORATORY

Common Name: N,N-Dimethylcyclohexylamine
Chemical Name: Cyclohexanamine, N,N-Dimethyl- (9CI)
Synonyms: Cyclohexylamine, N,N-dimethyl- (8CI)
Cyclohexyldimethylamine
(Dimethylamino)cyclohexane
CAS Registry No.: 98-94-2
Chemical Structure:



Physical and Chemical Properties:

Molecular Weight:	127.22
Appearance:	Straw colored liquid
Odor:	Amine odor
Melting Point:	<-77°C
Boiling Point:	159°C
Density:	0.8490 g/cc @ 20°C
Vapor Pressure:	38 mm Hg @ 77°C
Vapor Density: (air = 1)	4.39
Flash Point:	95°F (TCC)
Solubility:	1.5% in water; completely soluble in kerosene and No. 2 Fuel Oil
Conversion Factor:	1 mg/l = 192 ppm; 1 ppm = 5.20 mg/l
Concentration in air saturated with vapor:	4000 ppm

TOXICITY

A. Acute

1. Oral

- LD50 (rats) = 200-400 mg/kg (undiluted) (1).
- LD50 (rats) = 800-1600 mg/kg (10%) (1).

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The difference in the acute lethal oral dose is related to the marked corrosivity of N,N-dimethycyclohexylamine to the gastrointestinal tract. The corrosivity of the 10% solution is much less and less internal injury is thus found.

2. Skin

- LD50 (guinea pigs) = 10-20 ml/kg (1).
- N,N-Dimethylcyclohexylamine produced necrosis when applied to the skin of guinea pigs (1).
- N,N-Dimethylcyclohexylamine is considered to be a corrosive material when tested according to the protocols of the DOT test (2).
- No evidence of sensitization was found after repeated application of a 1% solution to guinea pig skin (1).

3. Eyes

- One drop of the undiluted material produced corneal damage in the rabbit eye (1).

4. Inhalation

- 3/3 rats exposed for 1.5 hours to 2670 ppm died. Exposure of another group of 3 rats for 6 hours at 150 ppm failed to kill any of the animals (1).
- Inhalation causes respiratory tract irritation (3).
- Inhalation of the vapors from a leaking drum of N,N-dimethyl cyclohexylamine for less than 2 hours caused three workmen to have symptoms including vomiting, headache and some skin irritation (5).
- In another incident, a worker was exposed to the vapors of N,N-dimethylcyclohexylamine On the day following the exposure, he complained of nausea and an upset stomach. Recovery was uneventful (5).

B. Extended Studies

No information was found.

C. Carcinogenic, Mutagenic or Teratogenic Potential

No specific information was found. Lijinsky et al. (4) have reported that dimethylcyclohexylamine does not react with ingested nitrites to produce carcinogenic nitrosoamines.

D. Aquatic Studies

No information found.

REFERENCES

1. Unpublished Eastman Kodak Co. Data.

2. Unpublished Haskell Laboratory Data.

3. Patty, F. A., "Industrial Hygiene and Toxicology" Vol. II (1963).

4. Lijinsky, W., et al., "N-Nitroso Compounds and Form., Proc. Work. Conf. (1972)", p. 130-3 (CA 79:122463).

5. Unpublished Haskell Laboratory Correspondence.

Richard C. Graham:mdc
August 5, 1976

Updated by:
P. J. Lardear:taa
November 3, 1978

Chemical: m-Dinitrobenzene, CAS #99-65-0

Manufacture:

Processing:

Deleted

Confidential Business Information

Prime Application: Site limited intermediate used in manufacture of phenylenediamines

Environmental Release:

(a) Associated with manufacture: 70M-72M lbs/yr to plant wastewater treatment facility.

(b) Associated with processing: 60 lbs/yr to atmosphere.

Worker Exposure:

(a) Manufacture: Total number of workers exposed = 49. (Includes operators with full-shift exposure and maintenance/technical personnel having casual exposure)

Exposure Level: 0.01mg/m^3, 8-hr TWA

Exposure Duration: Operators - 70 days/yr, Maintenance personnel - 40 days/yr.

(b) Processing: Total number of workers exposed = 55. (Includes operators with full-shift exposure and maintenance/technical personnel having casual exposure.)

Exposure Level: 0.01 mg/m^3, 8-hr. TWA

Exposure Duration: Operators - 70 days/yr, Maintenance personnel - 40 days/yr.

Exposure Control:

- Exposure Limits: ACGIH TLV: 0.15 ppm (1.0 mg/m^3) 8-hr TWA
  0.5 ppm (3.0 mg/m^3) STEL
  Avoidance of skin contact

- Nomex outerwear and neoprene gloves, boots and apron routinely used. Full butyl rubber chemical suit with respiratory protection (cartridge respirator or air-line mask) used in operations having significant exposure potential.

- Medical Surveillance Program: Workers with exposure potential to m-dinitrobenzene are periodically biologically monitored (through urinalysis for free amines and nitro compounds) as protection against cyanosis.