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Material Safety Data Sheet

March 26, 2001

1. Product Identification

N, N-DIMETHYLANILINE

Synonyms: Benzenamine, N,N-dimethyl-; (Dimethylamino)Benzene; Dimethylphenylamine; N,N-Dimethyl-Aniline; N,N-Dimethylbenzeneamine; Xylidine; N,N-dimethylbenzenamine

CAS No: 121-69-7

Molecular Weight: 121.1816

Chemical Formula: C₈H₁₁N (C₆H₅N(CH₃)₂)

2. Composition/Information on Ingredients

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
Dimethylaniline	121-69-7	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! MAY BE HARMFUL OR FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS BLOOD, KIDNEYS, LIVER, CARDIOVASCULAR SYSTEM. COMBUSTIBLE LIQUID AND VAPOR.

Potential Health Effects:

Inhalation:

May be fatal if excessively inhaled. Inhalation of vapors may cause systemic poisoning, with symptoms similar to those from ingestion exposure. Symptoms of exposure may be delayed.

Ingestion:

May be fatal if excessively ingested. Can cause methemoglobinemia. May cause bluish skin, headache, nausea, vomiting, and dry throat. Prominent central nervous system depression can occur, with confusion, ataxia, vertigo, tinnitus, weakness, disorientation, lethargy, drowsiness, convulsions, and coma. Death may occur from cardiovascular collapse. May cause kidney and liver damage and blood disorders. Symptoms of exposure may be delayed. Ingestion of large quantity may be fatal.

3. Hazards Identification (Continued)

Skin Contact:

May cause irritation, redness, and pain. Readily absorbed through the skin. Symptoms may parallel those from ingestion exposure. Effects from skin exposure may be delayed.

Eye Contact:

May cause irritation, redness, pain, and corneal damage.

Chronic Exposure:

Explosion Sensitivity to Mechanical Impact:

Not sensitive.

Explosion Sensitivity to Static Discharge:

High concentration of vapors of this compound may be sensitive to static discharge.

Fire Extinguishing Media:

Water spray, dry chemical, alcohol foam, polymer foam or carbon dioxide. Water spray may be used to keep fire exposed containers cool, but should not be directed at burning material.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Fight fire from maximum distance.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802. If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures.

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be posted as "No Smoking" areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Do Not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits (in ppm):

ACGIH TLVs
TWA = 5; PEL = 15

OSHA PELs
TWA = 10; PEL = Not Established

NIOSH RELs
TWA = 10; PEL = Not Established

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Respiratory Equipment:

Personal Respirators (NIOSH Approved): If the exposure limit is exceeded, a half-face organic vapor respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not

known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Body Protection:

Use body protection appropriate for task (e.g., Apron or Tyvek suit). If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, wear foot protection, as described in U.S. OSHA 29 CFR 1910.136.

9. Physical and Chemical Properties

<u>Appearance:</u> Pale yellow to brown oily liquid	<u>Boiling Point:</u> 193°C (379°F)	<u>Odor:</u> Amine-like odor	<u>Melting Point:</u> 2.5°C (36°F)
<u>Solubility:</u> Negligible	<u>Vapor Density (Air=1):</u> 4.17	<u>Vapor Pressure @ 25°C (77°F) [mm Hg]:</u> 0.52	
<u>Specific Gravity @ 20°C/4°C:</u> 0.956	<u>pH @ 1.2 g/L (@ 20°C/4°C):</u> 7.4	<u>Evaporation Rate (BuAc=1):</u> < 1	
<u>% Volatiles by volume @ 21°C (70°F):</u> No information found	<u>Coefficient of Oil/Water Distribution:</u> Log P (oct): 2.31-2.62	<u>Density:</u> 8.0 lbs/gal	

10. Stability and Reactivity

Stability:

Stable under normal conditions of use and storage.

Hazardous Decomposition Products:

Emits toxic fumes of nitric oxides, carbon oxides, and aniline when heated to decomposition.

Hazardous Polymerization:

This substance does not polymerize.

Incompatibilities:

Dibenzoyl peroxide, diisopropyl peroxydicarbonate. Contact with oxidizing agents may cause fire. Contact with acids may cause splattering. May attack plastics and rubber.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Toxicity Data:

Open Irritation Test (Skin-Rabbit) 10 mg/24 hours: Mild; Standard Draize Test (Skin-Rabbit) 500 mg/24 hours: Mild; Standard Draize Test (Eye-Rabbit) 20 mg/24 hours: Moderate; LDLo (Oral-Human) 50 mg/kg: Gastrointestinal: nausea or vomiting, other changes; LD₅₀ (Oral-Rat) 951 mg/kg; Behavioral: somnolence (general depressed activity), tremor; Lungs, Thorax, or Respiration: cyanosis; LD₅₀ (Skin-Rabbit) 1770 µL/kg; LD₅₀ (Skin-Guinea Pig) > 20 mL/kg; Skin and Appendages: dermatitis, other (after systemic exposure); LCLo (Inhalation-Rat) 250 mg/m³/4 hours: Behavioral: somnolence (general depressed activity), excitement; LDLo (Subcutaneous-Rat) 100 mg/kg; LDLo (Oral-Mouse) 350 mg/kg; TDLo (Oral-Rat) 32500 mg/kg/13 weeks-intermittent: Kidney, Ureter, Bladder: other changes; Blood: changes in spleen; Nutritional and Gross Metabolic: weight loss or decreased weight gain; TDLo (Oral-Rat) 16,250 mg/kg/13 weeks-intermittent: Liver: other changes; Blood: changes in bone marrow (not otherwise specified), changes in spleen; TDLo (Oral-Rat) 2 gm/kg/2 days-intermittent: Behavioral: food intake (animal), ataxia; Related to Chronic Data: death; TDLo (Oral-Rat) 1100 mg/kg/15 days-intermittent: Endocrine: changes in spleen weight; TDLo (Oral-Rat) 15450 mg/kg/2 years-continuous: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Endocrine: tumors; TDLo (Oral-Mouse) 32500 mg/kg/13 weeks-intermittent: Blood: changes in spleen; TDLo (Oral-Mouse) 32500 mg/kg/13 weeks-intermittent: Liver: other changes; Kidney, Ureter, Bladder: other changes; Blood: changes in spleen; TDLo (Oral-Mouse) 15,450 mg/kg/2 years-continuous: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Endocrine: tumors; TCLo (Inhalation-Rat) 10,700 µg/m³/5 hours/17 weeks-intermittent: Blood: pigmented or nucleated red blood cells, methemoglobinemia-carboxyhemoglobin; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: catalyses; TCLo (Inhalation-Rat) 300 µg/m³/24 hours/14 weeks-continuous: Behavioral: muscle contraction or spasticity; Blood: methemoglobinemia-carboxyhemoglobin, changes in erythrocyte (RBC) count

...Reproductive Toxicity Information:

Mutagenicity: DNA Damage (Intraperitoneal-Rat) 485 mg/kg; DNA Damage (Intraperitoneal-Mouse) 485 mg/kg; Mutation in Mammalian Somatic Cells (Mouse-Lymphocyte) 20 mg/L; Micronucleus Test (Hamster-Lung) 900 µmol/L; Cytogenetic Analysis (Hamster-Ovary) 83 mg/L; Sister Chromatid Exchange (Hamster-Ovary) 30 mg/L. N,N-Dimethylaniline is not reported to produce mutagenic effects in humans.

Embryotoxicity: N,N-Dimethylaniline is not reported to produce embryotoxic effects in humans.

Teratogenicity: N,N-Dimethylaniline is not reported to produce teratogenic effects in humans.

Other Reproductive Toxicity: N,N-Dimethylaniline is not reported to produce adverse reproductive effects in humans.

11. Toxicological Information (Continued)

Suspected Cancer Agent: N,N-Dimethylaniline is listed as follows by agencies tracking carcinogenic potential:

ACGIH	IARC
TLV-A4 (Not Classifiable as a Human Carcinogen)	Group 3 (Unclassifiable as to Carcinogenicity in Humans)

12. Ecological Information

Environmental Fate/Stability:

When released into the soil, this material is not expected to biodegrade. When released into the soil, this material may leach into groundwater. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than 1 day.

Acute Aquatic Toxicity:

The aquatic toxicity data currently available for N,N-Dimethylaniline are: NOEC (*Chaetogammarus marinus*) 96 hours = 10 mg/L; LC₅₀ (*Tubifex* worms) 48 hours = 200-360 mg/L; LC₅₀ (*Daphnia magna* Straus giant water flea) 48 hours = 5 mg/L; LC₅₀ (*Chaetogammarus marinus*) 24 hours = 85 mg/L; LC₅₀ (*Chaetogammarus marinus*) 48 hours = 61 mg/L; LC₅₀ (*Chaetogammarus marinus*) 96 hours = 38 mg/L; LC₅₀ (*Pimephales promelas*) 96 hours = 66 mg/L; LC₅₀ (*Oryzias latipes*) 48 hours = 76 mg/L; LC₅₀, F (*Carassius auratus*) 48 hours = 69 mg/L; LC₅₀, F (*Oryzias latipes*) 48 hours = 78 mg/L; LC₅₀, F (*Pimephales promelas*) 96 hours = 52; 78 mg/L; LC₅₀, F (*Cyprinus*

carpio) 48 hours = 69 mg/L; LC₅₀S (*Oryzias latipes*) 48 hours = 33; 98 mg/L; EC₀ (*Pseudomonas putida* bacteria) 16 hours = 1,050 mg/L; EC₀ (*Daphnia magna Straus* giant water flea) 24 hours = 8 mg/L; EC₀ (*Daphnia magna Straus* giant water flea) 48 hours = 0.8 mg/L; EC₁₀ (*Scenedesmus subspicatus*) 96 hours = 210 mg/L; EC₅₀ (*Tetrahymena pyriformis* algae) 24 hours = 110 mg/L; EC₅₀ (*Daphnia magna Straus* giant water flea) 24 hours = 13 mg/L; EC₅₀ (*Scenedesmus subspicatus*) 96 hours = 340 mg/L; EC₁₀₀ (*Daphnia magna Straus* giant water flea) 24 hours = 40 mg/L; EC₁₀₀ (*Daphnia magna Straus* giant water flea) 48 hours = 20 mg/L

Bioconcentration:

The BCF for N,N-Dimethylaniline ranges from 3-13, based on experimental results using carp over a 48-hour period in a static system. According to a classification scheme, this BCF suggests that the potential for bioconcentration in aquatic organisms is low.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with Federal, State and local requirements.

14. Transport Information

U.S. D.O.T.

Proper Shipping Name: N,N-Dimethylaniline
 Hazard Class: 6.1 (Toxic)
 UN/NA: UN2253
 Packing Group: II
 D.O.T Hazard Label: Class 6.1 (Toxic)

International (Water, I.M.O.)

Proper Shipping Name: N,N-Dimethylaniline
 Hazard Class: 6.1 (Toxic)
 UN/NA: UN2253
 Packing Group: II
 Hazard Label: Class 6.1 (Toxic)
 Stowage Category: Category A

International (Air, I.C.A.O./I.A.TA)

Proper Shipping Name: N,N-Dimethylaniline
 Hazard Class: 6.1 (Toxic)
 UN/NA: UN2253
 Packing Group: II
 Hazard Label: Class 6.1 (Toxic)
 Limited Quantity Packing Instruction: Y609
 Limited Quantity Maximum Quantity Per Package: 1 liter
 ERG Code: 6L

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----

Ingredient	TSCA	EC	Japan	Australia
Dimethylaniline (121-69-7)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	----Canada----			
	Korea	DSL	NDSL	Phil.
Dimethylaniline (121-69-7)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----

Ingredient	--SARA 302--		-----SARA 313-----	
	RQ	TPO	List	Chemical Catg.
Dimethylaniline (121-69-7)	No	No	Yes	No

-----\Federal, State & International Regulations - Part 2\-----

Ingredient	-RCRA-		-TSCA-	
	CERCLA	261.33	8(d)	
Dimethylaniline (121-69-7)	100	No	Yes	

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No

U.S. SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 3X Poison Schedule: No information found.

Canadian WHMIS: WHMIS Classification: Not currently rated as to classification.

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings:

Health: 3 (Materials Extremely Hazardous to Health, but Areas May be Entered with Extreme Care);
 Flammability: 2 (Materials Which Must Be Moderately Preheated Before Ignition Will Occur) Reactivity: 0
 (Materials Which are Normally Stable Even Under Fire Exposure Conditions and Which are not Reactive with Water)

Label Hazard Warning:

DANGER! MAY BE HARMFUL OR FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS BLOOD, KIDNEYS, LIVER, CARDIOVASCULAR SYSTEM. COMBUSTIBLE LIQUID AND VAPOR.

Label Precautions:

Do not get in eyes, on skin, or on clothing.	Use only with adequate ventilation.
Do not breathe vapor.	Wash thoroughly after handling.
Keep container closed.	Keep away from heat and flame.

Label First Aid:

If swallowed, do not induce vomiting unless directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases get medical attention immediately.

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