

Material Safety Data for: Diethylenetriamine

1. PRODUCT IDENTIFICATION

Name	2,2'-Diaminodiethylamine
Synonyms	N-(2-Aminoethyl)-1,2-ethanediamine, DETA, and others
CAS#	111-40-0
EU#	203-865-4
Product Uses	chelating agents, surfactants, resins, corrosion inhibitors

2. INGREDIENTS

	%	TWAEV / TLV mg/m ³	LD ₅₀ ORAL	(mg/kg) SKIN	LC ₅₀ ppm INHALATION
Diethylenetriamine	100%	1 / 4 (skin)	1080	163	7.6*

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: combustible liquid, may be corrosive to skin, lungs and eyes; known skin sensitiser

Canada – WHMIS

Key:

D 2B, E

B 2 – Flash Point <38°C, **B 3** – Flash Point >38°C & <93°C

D 1 – Immediately Toxic, **D 2** – Chronic Toxicity

C – Oxidising Substance, **E** – Corrosive

U.S.A. – HMIS

Key:

Health – 3, Fire – 1, Reactivity – 2

0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

Skin Contact	irritating; prolonged contact corrosive with blistering & scarring
Skin Absorption	slight; no toxic effects likely by this route
Eye Contact	liquid or mist severely irritating, possibly corrosive to eyes; may cause permanent damage;
vapour	may cause hazy, foggy vision due to (painless) corneal swelling which resolves in a day
Inhalation	mist irritating to respiratory tract; sore throat, coughing, wheezing & shortness of breath
Ingestion	corrosive to mouth, throat, stomach; may cause abdominal pain, nausea, vomiting, diarrhoea, thirst, weakness and even death – not a route of industrial exposure

Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis & skin cracking; may damage liver & kidneys
Sensitising	human skin sensitiser; possible respiratory sensitiser
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals <i>NOTE: may react with nitrites to form nitrosamines, many of which are carcinogens.</i>
Reproductive Effect	no known effect in humans or animals
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD ₅₀ (oral)	1080, 1550, 1800 & 2300mg/kg (rat)
LD ₅₀ (skin)	678 & 1090mg/kg (rabbit), 163mg/kg (guinea pig)
LC ₉₀ (inhalation)	7.6ppm (rat) – *Note that this is an LD ₉₀ , 9 of 10 animals died at this dose, but the laboratory, and this result, may not be reliable

Please ensure that this MSDS is given to, and explained to people using this product.

(Diethylenetriamine, cont'd)

page 2

4. FIRST AID

- SKIN: Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.
- EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
- INHALATION: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.
- INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. PHYSICAL PROPERTIES

- | | |
|---|---|
| Odour & Appearance | clear, colourless to pale yellow, hygroscopic liquid with pungent ammonia odour |
| Odour Threshold | not known |
| Vapour Pressure | 0.23mmHg / 0.031kPa (20°C / 68°F) |
| Evaporation Rate (<i>Butyl Acetate = 1</i>) | not known – <i>not considered volatile</i> |
| Vapour Density (air = 1) | 3.6 |
| Boiling Range | 207°C / 405°F |
| Freezing Point | -39°C / -38°F |
| Specific Gravity | 0.955 (20/20°C) |
| Water Solubility | complete |
| Also soluble in | most organic solvents, including aromatic hydrocarbons; low solubility in aliphatic HCs |
| Viscosity | 7.1 centipoise (25°C / 77°F) |
| pH | above 12 – <i>strongly alkaline</i> |
| Conversion Factor | 1ppm = 4.21mg/m ³ |
| Molecular Weight | 103grams per mole |

6. FLAMMABILITY & FIRE FIGHTING

- | | |
|----------------------------|--|
| Flash Point | 94°C / 202°F (closed cup); <i>also 98°C / 208°F (open cup)</i> |
| Autoignition Temperature | 358°C / 676°F |
| Flammable Limits | 2% – 6.7% |
| Combustion Products | carbon monoxide, nitrogen oxides, smoke, hydrogen cyanide, ammonia |
| Fire Fighting Precautions | foam, water fog, water spray, water jet spreads flames; fire fighters must wear SCBA |
| Static Charge Accumulation | cannot accumulate a static charge on agitation or pumping |

7. STABILITY / REACTIVITY

- | | |
|--------------------------------|---|
| Dangerously Reactive With | strong oxidising agents; strong acids; halogens, halogenated compounds, cellulose nitrate |
| Also Reactive With | may form explosive compounds with sodium or calcium hypochlorite, silver, cobalt or chromium; corrosive to aluminum, copper, copper alloys & tin; decomposes nitromethane & similar compounds |
| Stability | stable, but gradually absorbs CO ₂ from air forming carbamates; will not polymerize |
| Decomposes in Presence of | not known |
| Decomposition Products | none apart from Hazardous Combustion Products |
| Sensitive to Mechanical Impact | no |

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(Diethylenetriamine, cont'd)

8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

ACGIH TLV	1ppm / 4.2mg/m ³ (skin)
OSHA PEL	10ppm / 42mg/m ³ (skin)
STEL	not listed
Ventilation	mechanical ventilation (corrosion-resistant) may be required to control airborne titre below regulated limits; a respirator with organic vapour (alkaline) cartridge may be required for “escape” purposes (<i>store respirator in</i>
	<i>air-tight “Tupperware” or “Zip-Lock” container to preserve “freshness”</i>)
Hands	butyl, neoprene or “Viton” gloves recommended – <i>other types may also protect; consult supplier for suitability</i>
Eyes	chemical goggles– <i>always protect the eyes</i> – depending on workplace, a face shield may also be appropriate
Clothing	wear impermeable (above) apron, boots, & long sleeves if there is any danger of splashing

9. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat and substances named in Part 7. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use.

Avoid breathing product vapour. Use with adequate ventilation. If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator with organic vapour (alkaline) cartridge.

Never cut, drill, weld or grind on or near this container. Avoid all contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

10. SPILL PROCEDURES

Leak Precaution	dyke to control spillage and prevent environmental contamination
Handling Spill	ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep, shovel & store in closed containers for recycling or disposal

11. DISPOSAL

Waste Disposal	do not flush to sewer , recycle solvent if possible, may be incinerated in approved facility with flue gas scrubbing & monitoring – after mixing with a suitable flammable waste
Containers	Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>

12. ENVIRONMENTAL INFORMATION

Bioaccumulation	this product is not a bioaccumulator
Biodegradation	this product degrades readily and rapidly in the presence of oxygen if other carbon sources are also available; 55% biodegraded in 6 weeks in a test with acclimated sewage sludge
Abiotic Degradation	this product reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 2.7 hr
Mobility in soil, water	this product is water soluble and will move readily in soil and water
Aquatic Toxicity	
LC ₅₀ (Fish, 96hr)	430mg/litre (Leuciscus idus), 248, 332 & 1014mg/litre (Poecilia reticulata)
LC ₅₀ (Crustacea, 48hr)	53.5mg/litre (Daphnia magna)
EC ₅₀ (Crustacea, 48hr)	16 & 65mg/litre (Daphnia magna)
EC ₅₀ (Algae)	592mg/litre (Scenedesmus subspicatus), 346 & 1164mg/litre (Senastrum capricornutum)
EC ₅₀ (Bacteria)	1.7mg/litre (domestic sewage sludge), 96 & 2000mg/litre (Pseudomonas putida)

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(Diethylenetriamine, cont'd)

page 4

13. TRANSPORT REGULATIONS

Canada TDG	PIN	UN-2079
AND	Shipping Name	diethylenetriamine
U.S.A. 49 CFR	Class	8
	Packing Group	II
Marine Pollutant		not a marine pollutant

14. EMERGENCY INFORMATION

Canada	Call CANUTEC (collect)	(613) 996-6666
U.S.A.	Call CHEMTREC	(800) 424-9300

15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory (EC#)

NIOSH Recommendations: Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 1 ppm (4 mg/cu m). Skin.

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 1 ppm, skin. Excursion Limit Recommendation: Excursions in worker exposure levels may exceed 3 times the TLV-TWA for no more than a total of 30 minutes during a work day, and under no circumstances should they exceed 5 times the TLV-TWA, provided that the TLV-TWA is not exceeded.

TSCA Requirements: Section 8(a) of TSCA requires manufacturers of this chemical substance to report preliminary assessment information concerned with production, use, and exposure to EPA as cited in the preamble in 51 FR 41329. Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. Diethylenetriamine is included on this list.

16. PREPARATION INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

File Name: **diethylenetriamine**

With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available

Preparation Date: **December 2003** Revision Date: **December 2006, December 2009**

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