

MSDS – MATERIAL SAFETY DATA SHEET

From: Ashonuj Chem Pvt. Ltd.

Fact. Tel: +91-22-27781956

43, Princess Street, 3 Devkaran Mansion, Off Tel: +91-22-22084293

1st Floor, Mumbai – 400 002. INDIA.

DIETHANOLAMINE

1. Product Identification

Synonyms: 2,2'-Iminodiethanol; 2,2'Iminobisethanol; Dietholyamine; DEA

CAS No.: 111-42-2

Molecular Weight: 105.14

Chemical Formula: (HOCH₂CH₂)₂NH

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Diethanolamine	111-42-2	100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! CAUSES IRRITATION TO SKIN AND RESPIRATORY TRACT. CAUSES EYE BURNS. HARMFUL IF SWALLOWED OR ABSORBED THROUGH SKIN. MAY CAUSE ALLERGIC REACTION.

SAFETY DATA Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Life)

Flammability Rating: 1 - Slight

Reactivity Rating: 2 - Moderate

Contact Rating: 3 - Severe

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;
PROPER GLOVES

Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:

Low vapor pressure makes it a low inhalation hazard unless heated or misted. Vapor or mist cause irritation to the respiratory tract; symptoms include sore throat, sneezing and coughing. May also cause an allergic reaction.

Ingestion:

Single dose oral toxicity is low. Swallowing large amounts may cause severe mucosal irritation, erythema, blisters, or lesions of the mouth, esophagus, or gastro-intestinal tract. May also cause abdominal pain, nausea, vomiting and diarrhea. Estimated lethal dose 20 grams in humans. Many solvents and petroleum-based products with chemical structures similar to this product cause central nervous system depression. It is not known if diethanolamine causes such effects.

Skin Contact:

May cause irritation and redness. Solutions or contact with wet clothing may cause burns. A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts. May also cause an allergic reaction. May be absorbed through skin.

Eye Contact:

Vapor may cause irritation, tears, redness, and pain. Contact may cause severe irritation and corneal damage. May cause burns.

Chronic Exposure:

Prolonged or repeated skin exposure may cause dermatitis. Animal studies have shown target organ effects on the liver and kidney.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or impaired liver, kidney, and pulmonary function may be more susceptible to the effects of this material.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Immediately flush skin with plenty of soap and water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Flash point: 130C (266F) CC

Autoignition temperature: 662C (1224F)

Flammable limits in air % by volume:

lel: 1.6; uel: 9.8

Slight fire hazard when exposed to heat or flame.

Explosion:

Above the flash point, explosive vapor-air mixtures may be formed.

Fire Extinguishing Media:

Water, dry chemical, foam or carbon dioxide. Water spray may be used to keep fire exposed containers cool. Water stream or foam may cause frothing.

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.

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.

7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, ignition sources, moisture and incompatibilities. Storage and use should be in No Smoking Areas. Do not add nitrites or other nitrosating agents; a nitrosamine, which may cause cancer, may be formed. Spills of these organic liquids on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion. Containers of this material

may be hazardous when empty since they retain product residues (liquid, vapor); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-ACGIH Threshold Limit Value (TLV):

1 mg/m³ (TWA) inhalable fraction and vapor; skin

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.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half-face respirator with an organic vapor cartridge and particulate filter (NIOSH type N95 or better filter) 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 respirator with an organic vapor cartridge and particulate filter (NIOSH N 100 filter) 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. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P particulate filter. 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. This compound possibly exists in both particulate and vapor phase. A particulate (NIOSH type N95 or better) prefilter should be used for the particulate. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

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.

9. Physical and Chemical Properties

Appearance:

Colorless liquid.

Odor:

Ammonia odor.

Solubility:

Miscible in water.

Specific Gravity:

1.09 at 30C

pH:

11.0 0.1N aqueous sol.

% Volatiles by volume @ 21C (70F):

No information found.

Boiling Point:

269C (516F) Decomposes.

Melting Point:

28C (82F)

Vapor Density (Air=1):

3.6

Vapor Pressure (mm Hg):

< 0.01 @ 20C (68F); 5 mm @ 138C

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Hygroscopic. Darkens upon heating above 60C (140F). This product should not be heated above 60C in the presence of aluminum due to excessive corrosion and potential chemical reaction releasing flammable hydrogen gas.

Hazardous Decomposition Products:

Burning may produce carbon monoxide, carbon dioxide, nitrogen oxides.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Carbon dioxide, copper, copper alloys, galvanized iron, halogenated organic solvents, acids, and oxidizing agents. Concentrated solutions or higher temperatures can introduce reactivity hazards. N-nitrosamines, many of which are known to be potent carcinogens, may be formed when this product comes in contact with nitrous acid, nitrates or atmospheres with high nitrous oxide concentrations.

Conditions to Avoid:

Heat, flame, ignition sources, incompatibles, light, and air.

11. Toxicological Information

Oral rat LD50: 620 uL/kg; skin rabbit LD50: 7,640 uL/kg; irritation, standard Draize, eye rabbit: 750 ug/24H severe; skin rabbit: 500 mg/24H mild; investigated as a tumorigen, reproductive effector.

-----\Cancer Lists\-----

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Diethanolamine (111-42-2)	No	No	3

12. Ecological Information

Environmental Fate:

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into soil, this material is expected to have a half-life between 10 and 30 days. When released into water, this material is expected to readily biodegrade. When released into water, this material is expected to have a half-life between 10 and 30 days. 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. This material has an estimated bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. 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

Not regulated.

15. Regulatory Information

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-----\Chemical Inventory Status - Part 1\-----
Ingredient                               TSCA  EC   Japan  Australia
-----
Diethanolamine (111-42-2)              Yes   Yes  Yes    Yes
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--\Chemical Inventory Status - Part 2\-----
Ingredient                               Korea  DSL   NDSL   Phil.
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Diethanolamine (111-42-2)              Yes   Yes  No     Yes
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-----\Federal, State & International Regulations - Part 1\-----
Ingredient                               -SARA 302-  -SARA 313-
RQ    TPQ    List  Chemical Catg.
-----
Diethanolamine (111-42-2)              No    No    Yes    No
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-----\Federal, State & International Regulations - Part 2\-----
Ingredient                               -RCRA-      -TSCA-
CERCLA  261.33     8(d)
-----
Diethanolamine (111-42-2)              100        No        Yes
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Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

Australian Hazchem Code: None allocated.

Poison Schedule: None allocated.

WHMIS:

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: **1** Flammability: **1** Reactivity: **0**

Label Hazard Warning:

WARNING! CAUSES IRRITATION TO SKIN AND RESPIRATORY TRACT.
CAUSES EYE BURNS. HARMFUL IF SWALLOWED OR ABSORBED THROUGH
SKIN. MAY CAUSE ALLERGIC REACTION.

Label Precautions:

Do not get in eyes, on skin, or on clothing.

Avoid breathing dust, vapor, or mist.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Label First Aid:

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. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information: No Changes.

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