DIETHANOLAMINE

SECTION 1: Identification

1.1 Product identifier

Identification of the substance: DIETHANOLAMINE

CAS number: 111-42-2

Alternative name(s): DIETHANOLAMINE, DEA

Synonyms:
- 2,2'-iminodiethanol, 2,2'-iminodiethanol
- 2,2'-iminobisethanol
- 2-(2-hydroxyethylamino)ethanol
- Diethanolamine Diethanolamine (DEA)-
- OR30 diethanolamine _DEA_ 2,2'-iminodiethanol.

Alternative number(s): 050031

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Industrial use

1.3 Details of the supplier of the safety data sheet

Industrias Derivadas del Etileno S.A. de C.V.
Km. 4.2 Blvd. Morelos, Col. Complejo Petroquímico Morelos, 96400 Coatzacoalcos, Veracruz
Mexico

Telephone: +52 921-211-9000 / +52 921-268-2036
Website: www.idesa.com.mx

e-mail (competent person): jalvarez@idesa.com.mx

1.4 Emergency telephone number

Emergency information service:
- SETIQ 01-800-00-21400 / CHEMTREC 800-424-930
- / CANUTEC 613-996-66660
- Tel. (55) 5559 1588 Cd. de México.

SECTION 2: Hazard(s) identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

<table>
<thead>
<tr>
<th>Section</th>
<th>Hazard class</th>
<th>Category</th>
<th>Hazard class and category</th>
<th>Hazard statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1O</td>
<td>acute toxicity (oral)</td>
<td>4</td>
<td>Acute Tox. 4</td>
<td>H302</td>
</tr>
<tr>
<td>3.2</td>
<td>skin corrosion/irritiation</td>
<td>2</td>
<td>Skin Irrit. 2</td>
<td>H315</td>
</tr>
<tr>
<td>3.3</td>
<td>serious eye damage/eye irritation</td>
<td>1</td>
<td>Eye Dam. 1</td>
<td>H318</td>
</tr>
<tr>
<td>3.9</td>
<td>specific target organ toxicity - repeated exposure</td>
<td>2</td>
<td>STOT RE 2</td>
<td>H373</td>
</tr>
<tr>
<td>4.1A</td>
<td>hazardous to the aquatic environment - acute hazard</td>
<td>3</td>
<td>Aquatic Acute 3</td>
<td>H402</td>
</tr>
<tr>
<td>4.1C</td>
<td>hazardous to the aquatic environment - chronic hazard</td>
<td>3</td>
<td>Aquatic Chronic 3</td>
<td>H412</td>
</tr>
</tbody>
</table>
DIETHANOLAMINE

The most important adverse physicochemical, human health and environmental effects

Delayed or immediate effects can be expected after short or long-term exposure. Spillage and fire water can cause pollution of watercourses.

Additional information

According to the results of its assessment, this substance is not a PBT or a vPvB.

2.2 Label elements

Labeling

- Signal word danger
- Pictograms

GHS05, GHS07, GHS08

- Hazard statements

H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H373 May cause damage to organs through prolonged or repeated exposure (if swallowed).

- Precautionary statements

P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P264 Wash thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/eye protection/face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P321 Specific treatment (see on this label).
P330 Rinse mouth.
P501 Dispose of contents/container to industrial combustion plant.

2.3 Other hazards

Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance DIETHANOLAMINE

Identifiers

CAS No 111-42-2
Molecular formula C4H11NO2
Molar mass 105.1 g/mol
SECTION 4: First-aid measures

4.1 Description of first-aid measures

General notes
Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth.

Following inhalation
If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician. Provide fresh air.

Following skin contact
Wash with plenty of soap and water.

Following eye contact
Remove contact lenses, if present and easy to do. Continue rinsing. Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart.

Following ingestion
Place person in the recovery position. Never give anything by mouth.

Rinse mouth with water (only if the person is conscious). Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms and effects are not known to date.

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water spray, Alcohol resistant foam, BC-powder, Carbon dioxide (CO2)

Unsuitable extinguishing media
Water jet

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products
Nitrogen oxides (NOx), Carbon monoxide (CO), Carbon dioxide (CO2)

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance.
SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
 Remove persons to safety.

For emergency responders
 Wear breathing apparatus if exposed to vapors/dust/aerosols/gases.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advices on how to contain a spill
 Covering of drains

Advices on how to clean up a spill
 Wipe up with absorbent material (e.g. cloth, fleece). Collect spillage: Sawdust, Kieselgur (diatomite), Sand, Universal binder

Appropriate containment techniques
 Use of adsorbent materials.

Other information relating to spills and releases
 Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections


SECTION 7: Handling and storage

7.1 Precautions for safe handling

Recommendations
 - Measures to prevent fire as well as aerosol and dust generation
   Use local and general ventilation. Use only in well-ventilated areas.

Advice on general occupational hygiene
 Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

7.3 Specific end use(s)

See section 16 for a general overview.
DIETHANOLAMINE

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values (Workplace Exposure Limits)

<table>
<thead>
<tr>
<th>Country</th>
<th>Name of agent</th>
<th>CAS No</th>
<th>Identifier</th>
<th>TWA [ppm]</th>
<th>TWA [mg/m³]</th>
<th>STEL [ppm]</th>
<th>STEL [mg/m³]</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>MX</td>
<td>diethanolamine</td>
<td>111-42-2</td>
<td>VLE</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>NOM-010-STPS</td>
</tr>
</tbody>
</table>

Notation
- STEL: short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period unless otherwise specified.
- TWA: time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average.

Human health values

Relevant DNELs and other threshold levels

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Threshold level</th>
<th>Protection goal, route of exposure</th>
<th>Used in</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL</td>
<td>1 mg/m³</td>
<td>human, inhalatory</td>
<td>worker (industry)</td>
<td>chronic - local effects</td>
</tr>
<tr>
<td>DNEL</td>
<td>0.13 mg/kg</td>
<td>human, dermal</td>
<td>worker (industry)</td>
<td>chronic - systemic effects</td>
</tr>
</tbody>
</table>

Environment values

Relevant PNECs and other threshold levels

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Threshold level</th>
<th>Organism</th>
<th>Environmental compartment</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNEC</td>
<td>0.0022 mg/l</td>
<td>aquatic organisms</td>
<td>freshwater</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>0.00022 mg/l</td>
<td>aquatic organisms</td>
<td>marine water</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>100 mg/l</td>
<td>aquatic organisms</td>
<td>sewage treatment plant (STP)</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>0.012 mg/kg</td>
<td>aquatic organisms</td>
<td>freshwater sediment</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>0.0012 mg/kg</td>
<td>aquatic organisms</td>
<td>marine sediment</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>1.04 mg/kg</td>
<td>aquatic organisms</td>
<td>water</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>0.0011 mg/kg</td>
<td>terrestrial organisms</td>
<td>soil</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>PNEC</td>
<td>0.022 mg/l</td>
<td>aquatic organisms</td>
<td>water</td>
<td>intermittent release</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Appropriate engineering controls
- General ventilation.
Individual protection measures (personal protective equipment)

Eye/face protection
Wear eye/face protection.

Skin protection

- Hand protection
Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. In the case of wanting to use the gloves again, clean them before taking off and air them well. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

- Other protection measures
Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling.

Respiratory protection
In case of inadequate ventilation wear respiratory protection.

Environmental exposure controls
Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Appearance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>liquid</td>
</tr>
<tr>
<td>Color</td>
<td>colourless</td>
</tr>
<tr>
<td>Odor</td>
<td>ammonia-like odour</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other safety parameters</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>pH (value)</td>
<td>11 (53 g/l, 20 °C)</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>28 °C</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>270°C at 760 mmHg</td>
</tr>
<tr>
<td>Flash point</td>
<td>138 °C</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>not determined</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>not relevant (fluid)</td>
</tr>
</tbody>
</table>

Explosive limits

| - Lower explosion limit (LEL) | 1.6 vol% |
| - Upper explosion limit (UEL) | 9.8 vol% |
DIETHANOLAMINE

Vapor pressure 0.01 mm Hg at 25 °C
Relative Density 1.097 g/cm3 at 20 °C
Vapor density (air=1) 3.65

Solubility(ies)
- Water solubility Complete

Coefficient
- n-octanol/water (log KOW) -1.43 (25 °C)

Auto-ignition temperature 375 °C
Decomposition temperature 269.1 °C

Viscosity
- Dynamic viscosity 390 mPa s at 30 °C

Explosive properties none
Oxidizing properties none

SECTION 10: Stability and reactivity

10.1 Reactivity
Concerning incompatibility: see below "Conditions to avoid" and "Incompatible materials".

10.2 Chemical stability
See below "Conditions to avoid".

10.3 Possibility of hazardous reactions
No known hazardous reactions.

10.4 Conditions to avoid
There are no specific conditions known which have to be avoided.

10.5 Incompatible materials
With oxidizing agents, strong acids, acid anhydrides, acyl halides and alkyl halides may react violently. With nitrosating agents they form N-nitrosodiethanolamine, a carcinogen, in acid medium.
10.6 Hazardous decomposition products
Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known. Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification acc. to GHS

Acute toxicity
Harmful if swallowed.

- Acute toxicity estimate (ATE)
  Oral 680 mg/kg

Skin corrosion/irritation
Causes skin irritation.

Serious eye damage/eye irritation
Causes serious eye damage.

Respiratory or skin sensitization
Shall not be classified as a respiratory or skin sensitizer.

Germ cell mutagenicity
Shall not be classified as germ cell mutagenic.

Carcinogenicity
Shall not be classified as carcinogenic.

Reproductive toxicity
Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure
Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure (if swallowed).

<table>
<thead>
<tr>
<th>Hazard category</th>
<th>Target organ</th>
<th>Exposure route</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>several organs</td>
<td>if swallowed</td>
</tr>
</tbody>
</table>

Aspiration hazard
Shall not be classified as presenting an aspiration hazard.
SECTION 12: Ecological information

12.1 Toxicity
Harmful to aquatic life with long lasting effects.

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>&gt;100 mg/l</td>
<td>fish</td>
<td>96 h</td>
</tr>
<tr>
<td>LC50</td>
<td>&gt;2.15 mg/l</td>
<td>crustacean</td>
<td>48 h</td>
</tr>
<tr>
<td>EC50</td>
<td>72.9 mg/l</td>
<td>crustacean</td>
<td>48 h</td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability
Data are not available.

12.3 Bioaccumulative potential
Data are not available.

12.4 Mobility in soil
Data are not available.

12.5 Results of PBT and vPvB assessment
Data are not available.

12.6 Other adverse effects
Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Sewage disposal-relevant information
Do not empty into drains. Avoid release to the environment. Refer to special instructions/safety data sheets.

Waste treatment of containers/packages
Completely emptied packages can be recycled. Handle contaminated packages in the same way as the substance itself.

Remarks
Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.
**SECTION 14: Transport information**

14.1 UN number  
not subject to transport regulations

14.2 UN proper shipping name  
not relevant

14.3 Transport hazard class(es)  
Class -

14.4 Packing group  
not relevant

14.5 Environmental hazards

14.6 Special precautions for user  
There is no additional information.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code  
The cargo is not intended to be carried in bulk.

**Information for each of the UN Model Regulations**

- **Transport information - National regulations - Additional information (UN RTDG)**
  - Limited quantities (LQ) (UN RTDG)

- **International Maritime Dangerous Goods Code (IMDG)**  
  Not subject to IMDG.

- **International Civil Aviation Organization (ICAO-IATA/DGR)**  
  Not subject to ICAO-IATA.

**SECTION 15: Regulatory information**

15.1 Safety, health and environmental regulations specific for the product in question  
There is no additional information.

- **National regulations (United States)**

  - **Toxic Substance Control Act (TSCA)**  
    substance is listed

  - **SARA TITLE III (Superfund Amendment and Reauthorization Act)**
    - List of Extremely Hazardous Substances (40 CFR 355) (EPCRA Section 302 and 304) not listed
    - Specific Toxic Chemical Listings (40 CFR 372) (EPCRA Section 313)

<table>
<thead>
<tr>
<th>Name acc. to inventory</th>
<th>CAS No</th>
<th>Remarks</th>
<th>Effective date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethanolamine</td>
<td>111-42-2</td>
<td></td>
<td>1986-12-31</td>
</tr>
</tbody>
</table>

**CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)**  
- Section 102(A) Hazardous Substances (40 CFR 302.4)
DIETHANOLAMINE

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Remarks</th>
<th>Statutory code</th>
<th>Final RQ pounds (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethanolamine</td>
<td>111-42-2</td>
<td></td>
<td>3</td>
<td>100 (45.4)</td>
</tr>
</tbody>
</table>

Legend

"3" indicates that the source is section 112 of the Clean Air Act

Clean Air Act

corrosive

Not listed

New Jersey Worker and Community Right to Know Act N.J.S.A. 34:5A-1 et. seq.

Proposition 65 List of chemicals

<table>
<thead>
<tr>
<th>Name acc. to inventory</th>
<th>CAS No</th>
<th>Remarks</th>
<th>Type of toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethanolamine</td>
<td>111-42-2</td>
<td></td>
<td>Cancer</td>
</tr>
</tbody>
</table>

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information, including date of preparation or last revision

Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Description of used abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS</td>
<td>Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)</td>
</tr>
<tr>
<td>DGR</td>
<td>Dangerous Goods Regulations (see IATA/DGR)</td>
</tr>
<tr>
<td>DNEL</td>
<td>Derived No-Effect Level</td>
</tr>
<tr>
<td>GHS</td>
<td>&quot;Globally Harmonized System of Classification and Labelling of Chemicals” developed by the United Nations</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>IATA/DGR</td>
<td>Dangerous Goods Regulations (DGR) for the air transport (IATA)</td>
</tr>
<tr>
<td>ICACO</td>
<td>International Civil Aviation Organization</td>
</tr>
<tr>
<td>IMDG</td>
<td>International Maritime Dangerous Goods Code</td>
</tr>
<tr>
<td>MARPOL</td>
<td>International Convention for the Prevention of Pollution from Ships (abbr. of “Marine Pollutant”)</td>
</tr>
<tr>
<td>NOM-010-STPS</td>
<td>NORMA Oficial Mexicana NOM-010-STPS: Agentes químicos contaminantes del ambiente laboral-Reconocimiento, evaluación y control</td>
</tr>
<tr>
<td>PBT</td>
<td>Persistent, Bioaccumulative and Toxic</td>
</tr>
<tr>
<td>PNEC</td>
<td>Predicted No-Effect Concentration</td>
</tr>
</tbody>
</table>
DIETHANOLAMINE

Key literature references and sources for data


List of relevant phrases (code and full text as stated in chapter 2 and 3)

<table>
<thead>
<tr>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>H302</td>
<td>Harmful if swallowed.</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation.</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage.</td>
</tr>
<tr>
<td>H373</td>
<td>May cause damage to organs through prolonged or repeated exposure (if swallowed).</td>
</tr>
<tr>
<td>H402</td>
<td>Harmful to aquatic life.</td>
</tr>
<tr>
<td>H412</td>
<td>Harmful to aquatic life with long lasting effects.</td>
</tr>
</tbody>
</table>

Disclaimer

THIS INFORMATION IS BASED ON CALCULATED DATA. THE COMPANY HAS NO LIABILITY FOR DAMAGES SUFFERED BY BUYER OR OTHER PERSONS IN THE MANAGEMENT OF THESE MATERIALS IF SAFETY INSTRUCTIONS ARE NOT FULFILLED. THE COMPANY HAS NO LIABILITY FOR THE MISUSE OF THIS MATERIAL, EVEN IF THE SAFETY INSTRUCTIONS HAVE BEEN FOLLOWED. THE BUYER IS SOLELY RESPONSIBLE FOR THE USE OF THIS MATERIAL. THIS SAFETY DATA SHEET IS DRAWN UP IN ACCORDANCE WITH THE GUIDELINES SET OUT IN THE OFFICIAL MEXICAN STANDARDS ONLY. CONFIDENTIAL INFORMATION ABOUT THE COMPOSITION HAS BEEN DISCONTINUED.