

Safety data sheet

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BASF Safety data sheet according to Regulation (EC) No. 1907/2006

Date / Revised: 28.09.2012

Version: 9.0

Product: **Diethanolamine pure**

(ID no. 30036874/SDS_GEN_EU/EN)

Date of print 29.09.2012

1. Identification of the substance/mixture and of the company/undertaking

Product identifier

Diethanolamine pure

Chemical name: diethanolamine

CAS Number: 111-42-2

REACH registration number: 01-2119488930-28-0001, 01-2119488930-28-0000

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

Relevant identified uses: Chemical used in synthesis and/or formulation of industrial products

For the detailed identified uses of the product see appendix of the safety data sheet.

Details of the supplier of the safety data sheet

Company:

BASF SE

67056 Ludwigshafen

GERMANY

Operating Division Intermediates

Telephone: +49 621 60-42259

E-mail address: product-safety.intermediates@basf.com

Emergency telephone number

International emergency number:

Telephone: +49 180 2273-112

2. Hazards Identification

Label elements

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Globally Harmonized System, EU (GHS)

Pictogram:



Signal Word:

Danger

Hazard Statement:

H318	Causes serious eye damage.
H315	Causes skin irritation.
H302	Harmful if swallowed.
H412	Harmful to aquatic life with long lasting effects.
H373	May cause damage to organs through prolonged or repeated exposure.

Precautionary Statements (Prevention):

P280d	Wear eye/face protection.
P280c	Wear protective gloves.
P273	Avoid release to the environment.
P260i	Do not breathe dust/gas/mist/vapours.
P270	Do not eat, drink or smoke when using this product.
P264	Wash with plenty of water and soap thoroughly after handling.

Precautionary Statements (Response):

P310	Immediately call a POISON CENTER or doctor/physician.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P303 + P362	IF ON SKIN (on hair): Wash with plenty of soap and water.
P301 + P330	IF SWALLOWED: rinse mouth.
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.

Precautionary Statements (Disposal):

P501	Dispose of contents/container to hazardous or special waste collection point.
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According to Regulation (EC) No 1272/2008 [CLP]

Hazard determining component(s) for labelling: DIETHANOLAMINE

According to Directive 67/548/EEC or 1999/45/EC

as in Annex I of Directive 67/548/EEC

Hazard symbol(s)

Xn Harmful.



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R-phrase(s)

R22	Harmful if swallowed.
R38	Irritating to skin.
R41	Risk of serious damage to eyes.
R48/22	Harmful: danger of serious damage to health by prolonged exposure if swallowed.

S-phrase(s)

S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S46	If swallowed, seek medical advice immediately and show this container or label.

Hazard determining component(s) for labelling: DIETHANOLAMINE

Classification of the substance or mixture

According to Regulation (EC) No 1272/2008 [CLP]

Acute Tox. 4 (oral)
Skin Corr./Irrit. 2
Eye Dam./Irrit. 1
STOT RE 2
Aquatic Chronic 3

According to Directive 67/548/EEC or 1999/45/EC

Possible Hazards:
Harmful if swallowed.
Irritating to skin.
Risk of serious damage to eyes.
Harmful: danger of serious damage to health by prolonged exposure if swallowed.

For the classifications not written out in full in this section the full text can be found in section 16.

Other hazards

According to Regulation (EC) No 1272/2008 [CLP]

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

3. Composition/Information on Ingredients

Substances

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Chemical nature

2,2'-iminodiethanol; diethanolamine

CAS Number: 111-42-2

EC-Number: 203-868-0

INDEX-Number: 603-071-00-1

Hazardous ingredients (GHS)

according to Regulation (EC) No. 1272/2008

2,2'-iminodiethanol; diethanolamine

Content (W/W): >= 99.3 %

CAS Number: 111-42-2

EC-Number: 203-868-0

INDEX-Number: 603-071-00-1

Acute Tox. 4 (oral)

Skin Corr./Irrit. 2

Eye Dam./Irrit. 1

STOT RE 2

Aquatic Chronic 3

H318, H315, H302, H412, H373

Hazardous ingredients

according to Directive 1999/45/EC

2,2'-iminodiethanol; diethanolamine

Content (W/W): >= 99.3 %

CAS Number: 111-42-2

EC-Number: 203-868-0

INDEX-Number: 603-071-00-1

Hazard symbol(s): Xn

R-phrases: 22, 38, 41, 48/22

For the classifications not written out in full in this section, including the indication of danger, the hazard symbols, the R phrases, and the hazard statements, the full text is listed in section 16.

4. First-Aid Measures

Description of first aid measures

Remove contaminated clothing. If danger of loss of consciousness, place patient in recovery position and transport accordingly. Apply artificial respiration if necessary. First aid personnel should pay attention to their own safety.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention. Immediately inhale corticosteroid dose aerosol.

On skin contact:

Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

On contact with eyes:

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Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: Overexposure may cause: vomiting, nausea, coughing, headache

Indication of any immediate medical attention and special treatment needed

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:

water spray, dry powder, foam, carbon dioxide

Special hazards arising from the substance or mixture

nitrogen oxides, carbon oxides

The substances/groups of substances mentioned can be released in case of fire. Under certain conditions in case of fire other hazardous combustion products may be generated.

Advice for fire-fighters

Special protective equipment:

Wear self-contained breathing apparatus and chemical-protective clothing.

Further information:

Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

Avoid inhalation. Avoid contact with the skin, eyes and clothing.

Environmental precautions

Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

For large amounts: Pump off product.

For residues: Pick up with suitable absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr). Dispose of absorbed material in accordance with regulations.

Reference to other sections

Information regarding exposure controls/personal protection and disposal considerations can be found in section 8 and 13.

7. Handling and Storage

Precautions for safe handling

Ensure thorough ventilation of stores and work areas.

Protection against fire and explosion:

Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy.

Conditions for safe storage, including any incompatibilities

Segregate from acids and acid forming substances.

Suitable materials for containers: carbon steel (iron), Stainless steel 1.4401, Stainless steel 1.4301 (V2), High density polyethylene (HDPE), Low density polyethylene (LDPE), tin (tinplate), glass

Storage stability:

Storage temperature: 20 - 40 °C

Storage duration: 12 Months

May discolour after lengthy storage.

From the data on storage duration in this safety data sheet no agreed statement regarding the warrantee of application properties can be deduced.

Specific end use(s)

See exposure scenario(s) in the attachment to this safety data sheet.

8. Exposure Controls/Personal Protection

Control parameters

Components with occupational exposure limits

111-42-2: 2,2'-iminodiethanol; diethanolamine

PNEC

freshwater: 0.0022 mg/l

marine water: 0.00022 mg/l

intermittent release: 0.022 mg/l

sediment (freshwater): 0.019 mg/kg

sediment (marine water): 0.0019 mg/kg

soil: 0.00108 mg/kg

STP: 100 mg/l

DNEL

worker:

Long-term exposure- systemic effects, Inhalation: 1 mg/m³

worker:

Long-term exposure- systemic effects, dermal: 0.13 mg/kg

consumer:

Long-term exposure- systemic effects, Inhalation: 0.25 mg/m³

consumer:

Long-term exposure- systemic effects, dermal: 0.07 mg/kg

consumer:

Long-term exposure- systemic effects, oral: 0.06 mg/kg

Exposure controls**Personal protective equipment**

Respiratory protection:

Respiratory protection in case of vapour/aerosol release.

Consider the risk management measures as outlined in the exposure scenario.

Hand protection:

Chemical resistant protective gloves (EN 374)

Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN 374):

e.g. nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm), polyvinylchloride (0.7 mm) and other
Manufacturer's directions for use should be observed because of great diversity of types.

Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

Eye protection:

Tightly fitting safety goggles (cage goggles) (e.g. EN 166) and face shield.

General safety and hygiene measures

Avoid contact with the skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice. Wearing of closed work clothing is required additionally to the stated personal protection equipment.

9. Physical and Chemical Properties**Information on basic physical and chemical properties**

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Form:	liquid, solidified	
Colour:	colourless	
Odour:	mild, ammonia-like	
Odour threshold:		
	not determined	
pH value:	11.3 (100 g/l, 30 °C)	
Melting point:	27.4 °C	(other)
Boiling point:	269.9 °C (1,013 hPa) Cannot be distilled without decomposition at normal pressure.	(other)
Flash point:	176 °C	(DIN 51758, closed cup)
Evaporation rate:		
	not determined	
Flammability:	not self-igniting	(other)
Lower explosion limit:	2.1 %(V) (156 °C)	(air)
	For solids not relevant for classification and labelling.	
Upper explosion limit:	10.6 %(V) (193 °C)	(air)
	For solids not relevant for classification and labelling.	
Ignition temperature:	355 °C	
Vapour pressure:	0.0028 hPa (25 °C)	
Density:	1.0953 g/cm ³ (20 °C)	
Relative density:	1.09 (20 °C) (in liquid state)	(calculated)
Relative vapour density (air):	negligible	
Solubility in water:	miscible	
Partitioning coefficient n-octanol/water (log Kow):	-2.18 (25 °C; pH value: 7.1)	(OECD Guideline 107)
Self ignition:	not self-igniting	Test type: Spontaneous self- ignition at room-temperature.
Thermal decomposition:	285 °C, 450 kJ/kg (DSC (DIN 51007)) Thermal decomposition above the indicated temperature is possible.	
Viscosity, kinematic:	357.2 mm ² /s (30 °C)	(DIN 51562)
Explosion hazard:	not explosive	(other)
Fire promoting properties:	not fire-propagating	(other)

Other information

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Bulk density:	1.09 g/cm ³ (20 °C)	
pKA:	8.99 (25 °C)	(other)
Surface tension:	Based on chemical structure, surface activity is not to be expected.	
Grain size distribution:	Test substance	The substance / product is marketed or used in a non solid or granular form.
Molar mass:	105.14 g/mol	

10. Stability and Reactivity

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals:	No corrosive effect on metal.	
Formation of flammable gases:	Remarks:	Forms no flammable gases in the presence of water.

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

Reacts with acids. The progress of reaction is exothermic. Reacts with oxidizing agents. Reacts with halogenated compounds. Reacts with acid chlorides. Incompatible with acid chlorides and acid anhydrides.

Conditions to avoid

Avoid extreme heat. See MSDS section 7 - Handling and storage.

Incompatible materials

Substances to avoid:
oxidizing agents, acids, acid forming substances, isocyanates

Hazardous decomposition products

No hazardous decomposition products if stored and handled as prescribed/indicated.

Hazardous decomposition products:
carbon oxides, nitrogen oxides, nitrous gases

11. Toxicological Information

Information on toxicological effects

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Acute toxicity

Assessment of acute toxicity:

Of moderate toxicity after single ingestion. Virtually nontoxic after a single skin contact. The substance can be absorbed through the skin. Inhalation-risk test (IRT): The inhalation of a highly saturated vapor-air-mixture represents no acute hazard (mortality after an hour or later).

Experimental/calculated data:

LD50 rat (oral): approx. 1,600 mg/kg (BASF-Test)

rat (by inhalation): 8 h (BASF-Test)

Inhalation-risk test (IRT): No mortality within 8 hours as shown in animal studies. The inhalation of a highly saturated vapor-air mixture represents no acute hazard.

(dermal): Study does not need to be conducted.

LD50 rabbit (dermal): 12,970 mg/kg

Irritation

Assessment of irritating effects:

Skin contact causes irritation. May cause severe damage to the eyes.

Experimental/calculated data:

Skin corrosion/irritation rabbit: Irritant. (BASF-Test)

Serious eye damage/irritation rabbit: irreversible damage (BASF-Test)

The European Union (EU) has classified this substance with 'Risk of serious damage to eyes' (R41)

Respiratory/Skin sensitization

Assessment of sensitization:

Skin sensitizing effects were not observed in animal studies.

Experimental/calculated data:

Guinea pig maximization test guinea pig: Non-sensitizing. (OECD Guideline 406)

Germ cell mutagenicity

Assessment of mutagenicity:

No mutagenic effect was found in various tests with bacteria and mammalian cell culture. The substance was not mutagenic in a test with mammals.

Carcinogenicity

Assessment of carcinogenicity:

The whole of the information assessable provides no indication of a carcinogenic effect. Under certain conditions the substance can form nitrosamines. Nitrosamines are carcinogenic in animal studies. IARC (International Agency for Research on Cancer) has classified this substance as group 2B (The agent is possibly carcinogenic to humans).

Reproductive toxicity

Assessment of reproduction toxicity:

The product has not been fully tested. The statements have been derived in parts from products of a similar structure or composition. The results of animal studies gave no indication of a fertility impairing effect.

Developmental toxicity

Assessment of teratogenicity:

In animal studies the substance did not cause malformations.

Specific target organ toxicity (single exposure)

Assessment of STOT single:

The available information is not sufficient for evaluation.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

Repeated oral exposure may affect certain organs.

Aspiration hazard

No aspiration hazard expected.

12. Ecological Information

Toxicity

Assessment of aquatic toxicity:

Acutely toxic for aquatic organisms. Inhibition of degradation activity in activated sludge is not to be anticipated during correct introduction of low concentrations.

Toxicity to fish:

LC50 (96 h) 1,460 mg/l, *Pimephales promelas* (static)

Nominal concentration. Literature data.

Aquatic invertebrates:

EC50 (48 h) 55 mg/l, *Daphnia magna* (static)

Nominal concentration. Literature data.

Aquatic plants:

EC50 (96 h) 2.2 mg/l (growth rate), *Pseudokirchneriella subcapitata* (Algal growth inhibition test)

The details of the toxic effect relate to the nominal concentration.

Microorganisms/Effect on activated sludge:

EC20 (0.5 h) > 1,000 mg/l, activated sludge, domestic, aerobic (OECD Guideline 209, aquatic)

Nominal concentration.

Chronic toxicity to fish:
Study scientifically not justified.

Chronic toxicity to aquatic invertebrates:
No observed effect concentration (21 d), 0.78 mg/l, Daphnia magna (OECD Guideline 202, part 2, semistatic)
Nominal values (confirmed by concentration control analytics) The product will cause changes in the pH value of the test system. The result refers to an unneutralized sample.

Assessment of terrestrial toxicity:
Study scientifically not justified.

Persistence and degradability

Assessment biodegradation and elimination (H₂O):
Readily biodegradable (according to OECD criteria).

Elimination information:
93 % BOD of the ThOD (28 d) (OECD 301F; ISO 9408; 92/69/EEC, C.4-D) (aerobic, activated sludge, domestic)

Information on Stability in Water (Hydrolysis):
According to structural properties, hydrolysis is not expected/probable.

Bioaccumulative potential

Bioaccumulation potential:
Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Mobility in soil (and other compartments if available)

Assessment transport between environmental compartments:
The substance will not evaporate into the atmosphere from the water surface.
Adsorption to solid soil phase is not expected.

Results of PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative). Self classification

Additional information

Sum parameter

Chemical oxygen demand (COD): 1,352 mg/g

Biochemical oxygen demand (BOD) Incubation period 5 d: 885 mg/g

Other ecotoxicological advice:

Due to the pH-value of the product, neutralization is generally required before discharging sewage into treatment plants.

13. Disposal Considerations

Waste treatment methods

Incinerate in suitable incineration plant, observing local authority regulations.

A waste code in accordance with the European waste catalog (EWC) cannot be specified, due to dependence on the usage.

The waste code in accordance with the European waste catalog (EWC) must be specified in cooperation with disposal agency/manufacturer/authorities.

Contaminated packaging:

Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.

14. Transport Information

Land transport

ADR

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

RID

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

Inland waterway transport

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ADN

No dangerous good for ADN except for bulk transport in inland waterway vessel.

UN number: UN9006

UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains DIETHANOLAMINE)

Transport hazard class(es): 9, N3

Packing group: Not applicable

Environmental hazards: no

Special precautions for user:

Transport in inland waterway vessel: Type of inland waterway vessel: N
Cargo tank status: 4
Cargo tank type: 2
Environmental hazards: yes

Sea transport**IMDG**

Not classified as a dangerous good under transport regulations

UN number: Not applicable

UN proper shipping name: Not applicable

Transport hazard class(es): Not applicable

Packing group: Not applicable

Environmental hazards: Not applicable

Special precautions for user: None known

Air transport**IATA/ICAO**

Not classified as a dangerous good under transport regulations

UN number: Not applicable

UN proper shipping name: Not applicable

Transport hazard class(es): Not applicable

Packing group: Not applicable

Environmental hazards: Not applicable

Special precautions for user: None known

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Regulation: IBC

Shipment approved: 1

Pollution name: Diethanolamine

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Pollution category: Y
 Ship Type: 3

15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

16. Other Information

Assessment of the hazard classes according to UN GHS criteria (most recent version):

Acute Tox. 4 (oral)
 Skin Corr./Irrit. 2
 Eye Dam./Irrit. 1
 STOT RE 2
 Aquatic Acute 2
 No need for phys./chem. classification according to GHS criteria.
 Aquatic Chronic 3

Full text of the classifications, including the indication of danger, the hazard symbols, the R phrases, and the hazard statements, if mentioned in section 2 or 3:

Xn	Harmful.
22	Harmful if swallowed.
38	Irritating to skin.
41	Risk of serious damage to eyes.
48/22	Harmful: danger of serious damage to health by prolonged exposure if swallowed.
Acute Tox.	Acute toxicity
Skin Corr./Irrit.	Skin corrosion/irritation
Eye Dam./Irrit.	Serious eye damage/eye irritation
STOT RE	Specific target organ toxicity — repeated exposure
Aquatic Chronic	Hazardous to the aquatic environment - chronic
H318	Causes serious eye damage.
H315	Causes skin irritation.
H302	Harmful if swallowed.
H412	Harmful to aquatic life with long lasting effects.
H373	May cause damage to organs () through prolonged or repeated exposure.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. The data do not describe the product's properties (product specification). Neither should any agreed property nor the suitability of the product for any specific purpose be deduced from the data contained in the safety data sheet. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

Vertical lines in the left hand margin indicate an amendment from the previous version.