Chemical Safety Data Sheet MSDS / SDS

Diethylamine SDS

Revision Date:2024-04-25 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name: Diethylamine

CAS: 109-89-7

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

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

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SECTION 2: Hazards identification

Classification of the substance or mixture

Flammable liquids, Category 2
Acute toxicity - Category 4, Oral

Acute toxicity - Category 4, Dermal
Skin corrosion, Sub-category 1A
Acute toxicity - Category 4, Inhalation

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H225 Highly flammable liquid and vapour
H302 Harmful if swallowed
H312 Harmful in contact with skin
H314 Causes severe skin burns and eye damage
H332 Harmful if inhaled

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.

Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].
P370+P378 In case of fire: Use ... to extinguish.
P301+P317 IF SWALLOWED: Get medical help.
P330 Rinse mouth.

P302+P352 IF ON SKIN: Wash with plenty of water/...
P317 Get medical help.
P321 Specific treatment (see ... on this label).
P362+P364 Take off contaminated clothing and wash it before reuse.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P363 Wash contaminated clothing before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P316 Get emergency medical help immediately.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage

P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Diethylamine
Common names and synonyms:	Diethylamine
CAS number:	109-89-7
EC number:	203-716-3
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Half-upright position. Refer immediately for medical attention.

Following skin contact

First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again. Refer immediately for medical attention.

Following eye contact

Rinse with plenty of water (remove contact lenses if easily possible). Refer immediately for medical attention.

Following ingestion

Rinse mouth. Do NOT induce vomiting. Refer immediately for medical attention.

Most important symptoms/effects, acute and delayed

Irritation and burning of eyes, skin, and respiratory system. High concentration of vapor can cause asphyxiation. (USCG, 1999)

Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Organic bases/amines and related compounds/

SECTION 5: Firefighting measures

Suitable extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Vapors are irritating Behavior in Fire: Vapors are heavier than air and may travel considerable distance to a source of ignition and flash back. (USCG, 1999)

Special protective actions for fire-fighters

Use powder, alcohol-resistant foam, water in large amounts, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water. Combat fire from a sheltered position.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Remove all ignition sources. Evacuate danger area! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Ventilation. Collect leaking liquid in sealable plastic containers. Carefully collect remainder. Then store and dispose of according to local regulations.

Environmental precautions

Remove all ignition sources. Evacuate danger area! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Ventilation. Collect leaking liquid in sealable plastic containers. Carefully collect remainder. Then store and dispose of according to local regulations.

Methods and materials for containment and cleaning up

ACCIDENTAL RELEASE MEASURES: Personal precautions, protective equipment and emergency procedures: Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided. Methods and materials for containment and cleaning up: Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidizers, strong acids, organic compounds and food and feedstuffs. Cool. Well closed. Store only in original container. Store in an area without drain or sewer access.Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Storage class (TRGS 510): Flammable liquids.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 5 ppm as TWA; 15 ppm as STEL; (skin); A4 (not classifiable as a human carcinogen).MAK: 6.1 mg/m3, 2 ppm; peak limitation category: I(2); skin absorption (H); pregnancy risk group: D.EU-OEL: 15 mg/m3, 5 ppm as TWA; 30 mg/m3, 10 ppm as STEL

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety goggles, face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use closed system or ventilation.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Diethylamine is a clear colorless liquid with an ammonia-like odor. Density 5.9 lb / gal. Flash point -15°F. A respiratory irritant. Corrosive to the eyes and skin. Vapors heavier than air. Toxic oxides of nitrogen produced during combustion.
Colour:	Colorless liquid
Odour:	Fishy, ammonia-like odor
Melting point/freezing point:	-50°C
Boiling point or initial boiling point and boiling range:	55°C(lit.)
Flammability:	Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Lower and upper explosion limit/flammability limit:	Lower flammable limit: 1.8% by volume; Upper flammable limit: 10.1% by volume.
Flash point:	-23°C
Auto-ignition temperature:	594°F
Decomposition temperature:	no data available
pH:	STRONGLY ALKALINE
Kinematic viscosity:	0.319 mPa.s at 25 deg C; 0.239 mPa.s at 50 deg C
Solubility:	greater than or equal to 100 mg/mL at 63° F (NTP, 1992)
Partition coefficient n-octanol/water:	log Kow = 0.58
Vapour pressure:	14.14 psi (55 °C)
Density and/or relative density:	0.707g/mLat 25°C(lit.)

Relative vapour density:	2.5 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes on heating or on burning. This produces toxic fumes including nitrogen oxides. The substance is a medium strong base. Reacts with strong oxidants, acids and organic compounds. This generates fire or explosion hazard. Attacks metal, some forms of plastic, rubber and coatings.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

A very dangerous fire hazard when exposed to heat, flame, or oxidizers.The vapour is heavier than air and may travel along the ground; distant ignition possible.DIETHYLAMINE is strongly alkaline. Incompatible with strong oxidizing agents and with strong acids. Violent reactions occur with sulfuric acid. Causes ignition on contact with cellulose nitrate. Explodes on contact with dicyanofurazan or dicyanofuroxan. Attacks some forms of plastics, rubber and coatings. (NTP, 1992)

Conditions to avoid

no data available

Incompatible materials

Incompatible materials: Aldehydes, alcohols, dicyanofurazan, ketones, phenols, acids, halogenated hydrocarbon, oxidizing agents, epoxides.

Hazardous decomposition products

When heated to decomp it emits toxic fumes of /nitrogen oxides/.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Rat oral 540 mg/kg

Inhalation: LC50 Rat inhalation 4000 ppm/4 hr

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

A4: Not classifiable as a human carcinogen.

Reproductive toxicity

no data available

STOT-single exposure

The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion. Inhalation may cause lung oedema, but only after initial corrosive effects on eyes and/or airways have become manifest. Inhalation may cause pneumonitis. Exposure at high levels could cause severe swelling of the throat. Medical observation is indicated.

STOT-repeated exposure

Lungs may be affected by repeated or prolongated exposure to the vapour. The substance may have effects on the teeth. This may

result in erosion.

Aspiration hazard

A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50; Species: Pimephales promelas (Fathead minnow) age 30 days; Conditions: flow through, 24.7 deg C, pH 7.71, dissolved oxygen 7.1 mg/L, hardness 48.5 mg/L CaCO3, alkalinity 49.5 mg/L CaCO3; Concentration: 855 mg/L for 96 hr /98% purity

Toxicity to daphnia and other aquatic invertebrates: LC50; Species: Daphnia magna (Water flea); Conditions: freshwater, renewal; Concentration: 56000 ug/L for 48 hr (95% confidence interval: 32000-100000 ug/L) /99% purity

Toxicity to algae: EC50; Species: Pseudokirchneriella subcapitata (Green algae); Conditions: freshwater, static; Concentration: 20000 ug/L for 96 hr; Effect: general growth

Toxicity to microorganisms: no data available

Persistence and degradability

AEROBIC: Diethylamine, present at 100 mg/L, reached 69-89% of its Theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(1). In a screening study, diethylamine at 10 ppm degraded with both an activated sludge and freshwater/sediment inoculum, 59 and 38% of the Theoretical BOD was obtained after 12 days of incubation, respectively(2). Inhibition was noted at moderate concentrations and sizeable reductions in BOD were noted at 50 ppm(2). Diethylamine was degraded slowly by activated sludge even when acclimatized (53% of Theoretical BOD was achieved after 13 days)(3). However the concentration levels used in this study could not be ascertained. When added to stream water, the maximum rate of biodegradation of diethylamine was proportional to an initial amine concentration over a concentration range from several nanograms to several milligrams per liter(4). At the highest concentration studied, 10 mg/L, the half-life of diethylamine was 0.9 days(4).

Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for diethylamine(SRC), using a log Kow of 0.58(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of diethylamine can be estimated to be 27(SRC). According to a classification scheme(2), this estimated Koc value suggests that diethylamine is expected to have very high mobility in soil. The pKa of diethylamine is 11.09(3), indicating that this compound will exist entirely in cation form in the environment and cations generally adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(4).

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN1154 (For reference only, please check.)
IMDG: UN1154 (For reference only, please check.)
IATA: UN1154 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: DIETHYLAMINE (For reference only, please check.)
IMDG: DIETHYLAMINE (For reference only, please check.)
IATA: DIETHYLAMINE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.)
IMDG: 3 (For reference only, please check.)
IATA: 3 (For reference only, please check.)

Packing group, if applicable

ADR/RID: II (For reference only, please check.)
IMDG: II (For reference only, please check.)
IATA: II (For reference only, please check.)

Environmental hazards

ADR/RID: No
IMDG: No
IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Other Information

The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential.Immediate administration of an appropriate inhalation therapy by a doctor, or by an authorized person, should be considered.Do NOT take working clothes home.