

Chemical Safety Data Sheet MSDS / SDS

N-Nitrosodibutylamine

Revision Date:2024-07-06 Revision Number:1

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

Product name : N-Nitrosodibutylamine
CBnumber : CB0358200
CAS : 924-16-3
EINECS Number : 213-101-1
Synonyms : NDBA,N-Nitrosodibutylamine

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
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone : 400-158-6606

SECTION 2: Hazards identification**Classification of the substance or mixture**

Acute toxicity - Category 4, Oral
Carcinogenicity, Category 2

Label elements**Pictogram(s)**

☐

Signal word : Warning

Hazard statement(s)

H302 Harmful if swallowed
H351 Suspected of causing cancer

Precautionary statement(s)

P281 Use personal protective equipment as required.

Prevention

P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.

P203 Obtain, read and follow all safety instructions before use.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

Response

P301+P317 IF SWALLOWED: Get medical help.

P330 Rinse mouth.

P318 IF exposed or concerned, get medical advice.

Storage

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

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: N-Nitrosodibutylamine
Synonyms	: NDBA,N-Nitrosodibutylamine
CAS	: 924-16-3
EC number	: 213-101-1
MF	: C8H18N2O
MW	: 158.24

SECTION 4: First aid measures

Description of first aid measures

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately.

Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]: Inhalation of material may be harmful. Contact may cause burns to skin and eyes. Inhalation of Asbestos dust may have a damaging effect on the lungs. Fire may produce irritating, corrosive and/or toxic gases.

Some liquids produce vapors that may cause dizziness or suffocation. Runoff from fire control may cause pollution. (ERG, 2016)

Indication of any immediate medical attention and special treatment needed

Absorption, Distribution and Excretion

After oral administration of NDBA; in guinea pigs, glucuronide of N-nitroso-n-butyl-n-(3-hydroxybutyl)amine and traces of N-nitroso-n-butyl-n-(2-hydroxy-3-carboxypropyl)amine were... excreted.

SECTION 5: Firefighting measures

Extinguishing media

Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]: SMALL FIRE: Dry chemical, CO₂, water spray or regular foam. LARGE FIRE: Water spray, fog or regular foam. Do not scatter spilled material with high-pressure water streams. Move containers from fire area if you can do it without risk. Dike fire-control water for later disposal. FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. (ERG, 2016)

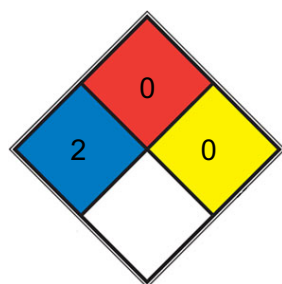
Specific Hazards Arising from the Chemical

Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]: Some may burn but none ignite readily. Containers may explode when heated. Some may be transported hot. For UN3508, be aware of possible short circuiting as this product is transported in a charged state. (ERG, 2016)

Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

NFPA 704



■ HEALTH 2 Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. [diethyl ether](#), ammonium phosphate, iodine)

■ FIRE 0 Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 820 °C (1,500 °F) for a period of 5 minutes.(e.g. Carbon tetrachloride)

■ REACT 0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium,[N₂](#))

□ SPEC.
HAZ.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

PRECAUTIONS FOR "CARCINOGENS": A high-efficiency particulate arrestor (HEPA) or charcoal filters can be used to minimize amt of carcinogen in exhausted air ventilated safety cabinets, lab hoods, glove boxes or animal rooms. ... Filter housing that is designed so that used filters can be transferred into plastic bag without contaminating maintenance staff is avail commercially. Filters should be placed in plastic bags immediately after removal. ... The plastic bag should be sealed immediately. ... The sealed bag should be labelled properly. ... Waste liquids ... should be placed or collected in proper containers for disposal. The lid should be secured & the bottles properly labelled. Once filled, bottles should be placed in plastic bag, so that outer surface ... is not contaminated. ... The plastic bag should also be sealed & labelled. ... Broken glassware ... should be decontaminated by solvent extraction, by chemical destruction, or in specially designed incinerators. Chemical Carcinogens

SECTION 7: Handling and storage

Precautions for safe 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

PRECAUTIONS FOR "CARCINOGENS": Storage site should be as close as practicable to lab in which carcinogens are to be used, so that only small quantities required for ... expt need to be carried. Carcinogens should be kept in only one section of cupboard, an explosion-proof refrigerator or freezer (depending on chemophysical properties ...) that bears appropriate label. An inventory ... should be kept, showing quantity of carcinogen & date it was acquired. ... Facilities for dispensing ... should be contiguous to storage area. Chemical Carcinogens

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

Component	N-nitrosodibutylamine			
CAS No.	924-16-3			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m³	ppm	mg/m³
Austria	?	0,0025	?	0,01
Germany	?	0,0002 (1)	?	?

(AGS)				
?	?	0,0005 (2)	?	?
?	?	0,001 (3)	?	?
	Remarks			
Austria	TRK value (based on technical feasibility) The TRK values applies to the sum of the classified N-Nitrosamines			
Germany (AGS)	Values applied to the sum of carcinogenic N-Nitrosamines (see TRGS 552). (1) Reference value that represents the state of the art for: Working with metal working fluids, volatile corrosion inhibitors (VCI), chemical industry (not stated below), foundries. (2) Reference value that represents the state of the art for: Chemical industry - working with amines, tyre industry - vulcanisation. (3) Reference value that represents the state of the art for: Chemical industry - manufacturing of polyacrylonitrile fibres, tyre industry - warehouses, technical rubber products, leather industries.			

Biological limit values

no data available

Exposure 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

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flammable resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	neat
Colour	Clear Colourless to Light Yellow
Odour	no data available
Melting point/freezing point	183°C(dec.)(lit.)
Boiling point or initial boiling point and boiling range	237°C(lit.)
Flammability	no data available
Lower and upper explosion limit/flammability limit	no data available
Flash point	-30°C(lit.)
Auto-ignition temperature	no data available
Decomposition temperature	no data available

pH	no data available
Kinematic viscosity	no data available
Solubility	Acetone (Slightly), Chloroform (Slightly), Ethyl Acetate (Slightly), Methanol (S
Partition coefficient n-octanol/water	log Kow = 2.63
Vapour pressure	4.69X10 ⁻² mm Hg at 25 deg C /Extrapolated/
Density and/or relative density	0.91 g/cm ³
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

No rapid reaction with air. No rapid reaction with water.

Chemical stability

Stable at room temperature for more than 14 days in neutral or alkaline aqueous solutions in dark, slightly less stable in acidic solutions; light-sensitive, especially to UV light.

Possibility of hazardous reactions

N-NITROSODI-N-BUTYLAMINE is a nitrated azo derivative. Azo, diazo, azido compounds can detonate. This applies in particular to organic azides that have been sensitized by the addition of metal salts or strong acids. Toxic gases are formed by mixing materials of this class with acids, aldehydes, amides, carbamates, cyanides, inorganic fluorides, halogenated organics, isocyanates, ketones, metals, nitrides, peroxides, phenols, epoxides, acyl halides, and strong oxidizing or reducing agents. Flammable gases are formed by mixing materials in this group with alkali metals. Explosive combination can occur with strong oxidizing agents, metal salts, peroxides, and sulfides.

Conditions to avoid

no data available

Incompatible materials

Strong oxidants (peracids) oxidize it to corresponding nitramine; can be reduced to corresponding hydrazine and or amine.

Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /nitrogen oxide/.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Hamster oral 2150 mg/kg
- Inhalation: no data available
- 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

CLASSIFICATION: B2; probable human carcinogen. BASIS FOR CLASSIFICATION: Increased incidences of several tumor types in rats, mice and hamsters exposed by various routes.

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

AEROBIC: Biodegradation data for N,N-dibutyl nitrosoamine were not located (SRC, 2005), however data were available for the structurally similar compounds N-nitrosodi-n-propylamine and N-nitrosodiethylamine. In one study, settled domestic wastewater was used as the inoculum for static biodegradation tests on N-nitrosodi-n-propylamine(1). The biodegradation after 7 days incubation each in the original culture and the first, second, and third subcultures at an initial N-nitrosodi-n-propylamine concentration of 5 mg/l was 27%, 37%, 47%, and 50%, respectively(1). At an initial concentration of 10 mg/L, the degradation was 0%, 8%, 40%, and 40%, respectively(1). In municipal activated sludge treatment plants, N-nitrosodi-n-propylamine influent concentrations of 0.5 and 6.7 ug/L were reduced by 88 and 99%, respectively(2). However, 0% removal of N-nitroso-n-propylamine was reported at two industrial activated sludge treatment plants with an average N-nitrosodi-n-propylamine influent concentration of 11 mg/L(2). No biodegradation of N-nitrosodi-n-propylamine occurred in die-away tests in Cayuga Lake water (New York) over a period of 3.5 months, and a lag of nearly 30 days was observed before its slow disappearance from soil(3). N-

Nitrosodi-n-propylamine's half-life in aerobic soils under laboratory conditions was about 3 weeks with volatilization and biodegradation being the primary removal processes(4). N-Nitrosodiethylamine, at 18.0 ppm in lake water, was essentially unchanged after 108 days incubation in the dark at 30 deg C(3). While the level of N-nitrosodiethylamine amended with raw sewage at pH 6.0 slowly decreased from approximately 17 ppm to 12 ppm over 14 days, the fact that the decrease was nearly the same in sterilized samples indicates that abiotic factors may have been responsible for the loss(3). N-Nitrosodiethylamine has been shown to slowly degrade in soil after a lag period. In one study, 50% of 14C-N-nitrosodiethylamine was mineralized from Matapeake loam soil in over a week at 30 deg C(4). Based on the data for these structurally similar compounds, biodegradation may be an important fate process for N,N-dibutylnitrosoamine in the environment.

Bioaccumulative potential

An estimated BCF of 59 was calculated for N,N-dibutylnitrosoamine(SRC), using a log Kow of 2.63(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is moderate(SRC), provided the compound is not altered physically or chemically once released into the environment.

Mobility in soil

The Koc of N,N-dibutylnitrosoamine is estimated as 642(SRC), using a log Kow of 2.63(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that N,N-dibutylnitrosoamine is expected to have low mobility in soil.

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: UN3399 (For reference only, please check.)

IMDG: UN3399 (For reference only, please check.)

IATA: UN3399 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: ORGANOMETALLIC SUBSTANCE, LIQUID, WATER- REACTIVE, FLAMMABLE (For reference only, please check.)

IMDG: ORGANOMETALLIC SUBSTANCE, LIQUID, WATER- REACTIVE, FLAMMABLE (For reference only, please check.)

IATA: ORGANOMETALLIC SUBSTANCE, LIQUID, WATER- REACTIVE, FLAMMABLE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 4.3 (For reference only, please check.)

IMDG: 4.3 (For reference only, please check.)

IATA: 4.3 (For reference only, please check.)

Packing group, if applicable

ADR/RID: I (For reference only, please check.)

IMDG: I (For reference only, please check.)

IATA: I (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

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Not Listed.

PICCS

Not Listed.

Vietnam National Chemical Inventory

Not Listed.

IECSC

Not Listed.

Korea Existing Chemicals List (KECL)

Not 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/>

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