1. Substance/preparation and company identification

**N-BUTYLENE-1,2-OXIDE**

Use: Chemical

Company:
BASF SE
67056 Ludwigshafen
GERMANY
Operating Division Petrochemicals
Telephone: +49 621 60-46050
Telefax number: +49 621 60-6646050
E-mail address: product_safety-alkylene_oxides_and_glycols@basf.com

Emergency information:
International emergency number:
Telephone: +49 180 2273-112

2. Hazard identification

Highly flammable.
Limited evidence of a carcinogenic effect.
Harmful by inhalation, in contact with skin and if swallowed.
Irritating to eyes, respiratory system and skin.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Category 3: Substances which cause concern for man due to possible carcinogenic effects, however, since sufficient information is not available a satisfactory assessment cannot be made.

3. Composition/information on ingredients

Chemical nature
4. First-aid measures

General advice:
Immediately 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:
If difficulties occur after vapour/aerosol has been inhaled, remove to fresh air and seek medical attention. Immediately inhale corticosteroid dose aerosol.

On skin contact:
Immediately wash thoroughly with soap and water, seek medical attention.

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

Note to physician:
Hazards: Skin resorption hazard.
Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-fighting measures

Suitable extinguishing media:
water, dry extinguishing media, alcohol-resistant foam, carbon dioxide

Special protective equipment:
Wear self-contained breathing apparatus and chemical-protective clothing.

Further information:
The degree of risk is governed by the burning substance and the fire conditions. Contaminated extinguishing water must be disposed of in accordance with official regulations.

6. Accidental release measures

Personal precautions:
Personal protection: wear a tightly closed chemical protection suit and a self-contained breathing apparatus.

Environmental precautions:
Do not discharge into drains/surface waters/groundwater.
Methods for cleaning up or taking up:
Pick up with suitable absorbent material. Dispose of absorbed material in accordance with regulations.

7. Handling and storage

Handling
Ensure thorough ventilation of stores and work areas. Handle in protective atmosphere.

Protection against fire and explosion:
Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy. Vapours may form explosive mixture with air.

Storage
Segregate from acids and bases.
Further information on storage conditions: Keep under inert gas. Keep container tightly closed in a cool, well-ventilated place.

8. Exposure controls and personal protection

Components with workplace control parameters

| 106-88-7: 1,2-epoxy-n-butane |

Personal protective equipment

Respiratory protection:
Self-contained breathing apparatus.

Hand protection:
Chemical resistant protective gloves (EN 374)
Suitable materials short-term contact and/or splashes (recommended: At least protective index 2, corresponding > 30 minutes of permeation time according to EN 374)
butyl rubber (butyl) - 0.7 mm coating thickness
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 (splash goggles) (e.g. EN 166)
Body protection:
Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures:
Handle in accordance with good industrial hygiene and safety practice. Avoid all contact with the substance.

9. Physical and chemical properties

Form: liquid
Colour: colourless
Odour: product specific
pH value: approx. 7
solidification temperature: approx. -130 °C
Boiling point: 65 °C
Flash point: -26 °C (DIN 51755)
Lower explosion limit: 3.9 % (V)
Upper explosion limit: 20.6 % (V)
Ignition temperature: 370 °C (DIN 51794)
Vapour pressure: 188 mbar (20 °C)
Density: 0.835 g/cm³ (15 °C)
Solubility in water: 59 g/l (20 °C)
Solubility (qualitative) solvent(s): polar solvents soluble
Partitioning coefficient n-octanol/water (log Pow): 0.7 (measured) (25 °C)
Viscosity, kinematic: approx. 0.51 mm²/s (20 °C)

10. Stability and reactivity

Conditions to avoid:
Avoid humidity.

Thermal decomposition: No data available.
Substances to avoid:
acids, bases, organometal salts, strong oxidizing agents

Corrosion to metals: No corrosive effect on metal.

Hazardous reactions:
Risk of polymerization.
The product is chemically stable.

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

11. Toxicological information

Acute toxicity

Assessment of acute toxicity:
Harmful by inhalation, in contact with skin and if swallowed.

LD$_{50}$ rat (oral): approx. 900 mg/kg (BASF-Test)

LC$_{50}$ rat (by inhalation): > 6.3 mg/l 4 h (BASF-Test)

LD$_{50}$ rabbit (dermal): 1,255 - 2,546 mg/kg

Irritation

Assessment of irritating effects:
Irritating to eyes, respiratory system and skin. EU-classification

Primary skin irritation rabbit: non-irritant (Draize test)

Primary skin irritation rabbit: Corrosive. (BASF-Test)

Primary irritations of the mucous membrane rabbit: Irritant. (BASF-Test)

Sensitization

Assessment of sensitization:
Skin sensitizing effects were not observed in animal studies.

Guinea pig maximization test guinea pig: Non-sensitizing.

Genetic toxicity

Assessment of mutagenicity:
The substance was mutagenic in various test systems with bacteria and cell cultures; however, these results could not be confirmed in tests with mammals.

Carcinogenicity
Assessment of carcinogenicity:
After lifelong inhalation exposure to concentrations that were severely damaging to the nasal epithelium, nasal tumors were induced in rats; in other species these findings were not found or were considerably less pronounced. Limited evidence of a carcinogenic effect.

**Reproductive toxicity**

Assessment of reproduction toxicity:
Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

**Developmental toxicity**

Assessment of teratogenicity:
No indications of a developmental toxic / teratogenic effect were seen in animal studies.

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12. Ecological information

**Ecotoxicity**

Assessment of aquatic toxicity:
Acutely harmful for aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish:
LC50 (96 h) > 100 - < 225 mg/l, Leuciscus idus (DIN 38412 Part 15, static)
Nominal concentration.

Aquatic invertebrates:
EC50 (48 h) 70 mg/l, Daphnia magna (Directive 84/449/EEC, C.2)
Nominal concentration.

Aquatic plants:
EC50 (72 h) > 500 mg/l, Scenedesmus subspicatus (DIN 38412 Part 9)
Nominal concentration.

Microorganisms/Effect on activated sludge:
EC20 (0.5 h) approx. 160 mg/l, (OECD Guideline 209)
Nominal concentration.

**Persistence and degradability**

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

Elimination information:
80 - 90 % CO2 formation relative to the theoretical value (28 d) (ISO 14593) (aerobic, activated sludge, domestic, non-adapted)

**Bioaccumulation potential**

Bioaccumulation potential:
Does not significantly accumulate in organisms.
Additional information

Other ecotoxicological advice:
The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

13. Disposal considerations

Incinerate in suitable incineration plant, observing local authority regulations.

Contaminated packaging:
Uncontaminated packaging can be re-used.
Packs that cannot be cleaned should be disposed of in the same manner as the contents.

14. Transport information

**Land transport**

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**Inland waterway transport**

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**Sea transport**

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15. Regulatory information

Regulations of the European union (Labelling) / National legislation/Regulations

EC-Number: 203-438-2

as in Annex I of Directive 67/548/EEC:

Hazard symbol(s)
F  Highly flammable.
Xn  Harmful.

R-phrase(s)
R11  Highly flammable.
R20/21/22  Harmful by inhalation, in contact with skin and if swallowed.
R36/37/38  Irritating to eyes, respiratory system and skin.
R40  Limited evidence of a carcinogenic effect.
R52/53  Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-phrase(s)
S2  Keep out of the reach of children.
S9  Keep container in a well-ventilated place.
S16  Keep away from sources of ignition - No smoking.
S29  Do not empty into drains.
S36/37  Wear suitable protective clothing and gloves.
S61  Avoid release to the environment. Refer to special instructions/safety data sheets.

Hazard determining component(s) for labelling: 1,2-EPOXYBUTANE

Other regulations
16. Other information

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

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.

as in Annex I of Directive 67/548/EEC
Carc. Cat. 3 - Category 3: Substances which cause concern for man due to possible carcinogenic effects, however, since sufficient information is not available a satisfactory assessment cannot be made.