1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifiers

Product name	:	1,3-Butadiene diepoxide
CAS-No.	:	1464-53-5

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

Identified uses	:	Laboratory chemicals, Manufacture of substances

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]
Flammable liquids (Category 3)
Acute toxicity, Oral (Category 3)
Acute toxicity, Inhalation (Category 2)
Acute toxicity, Dermal (Category 3)
Skin corrosion (Category 1B)
Germ cell mutagenicity (Category 1B)
Carcinogenicity (Category 1B)

Classification according to EU Directives 67/548/EEC or 1999/45/EC
Flammable. Very toxic by inhalation. Toxic in contact with skin and if swallowed. May cause cancer. May cause heritable genetic damage. Causes burns.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008 [CLP]

Pictogram

Signal word: Danger

Hazard statement(s)	
H226	Flammable liquid and vapour.
H301	Toxic if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H330	Fatal if inhaled.
H340	May cause genetic defects.
H350	May cause cancer.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P301 + P310	IF SWALLOWED: 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.

Supplemental Hazard Statements: none

Restricted to professional users.

According to European Directive 67/548/EEC as amended.

Hazard symbol(s)

R-phrase(s)	
R10	Flammable.
R26	Also very toxic by inhalation.
R34	Causes burns.
R45	May cause cancer.
R46	May cause heritable genetic damage.
R24/25	Also toxic in contact with skin and if swallowed.
R45	May cause cancer.
R46	May cause heritable genetic damage.
R24/25	Also toxic in contact with skin and if swallowed.
R26	Also very toxic by inhalation.
R10	Flammable.
R34	Causes burns.

S-phrase(s)	
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S53	Avoid exposure - obtain special instructions before use.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28	After contact with skin, wash immediately with plenty of water.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S53	Avoid exposure - obtain special instructions before use.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28	After contact with skin, wash immediately with plenty of water.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Restricted to professional users.

2.3 Other hazards - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	1,2,3,4-Diepoxybutane
Formula	:	C4H6O2C4H6O2

Component		Concentration
2,2'-Bioxirane		
CAS-No.	1464-53-5	<= 100 %
EC-No.	215-979-1	
Index-No.	603-060-00-1	
Methylene chloride		
CAS-No.	75-09-2	<= 3 %
EC-No.	200-838-9	
Index-No.	602-004-00-3	

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

4.3 Indication of immediate medical attention and special treatment needed

no data available

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

5.2 Special hazards arising from the substance or mixture

Carbon oxides, Hydrogen chloride gas

5.3 Precautions for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information

Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 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 vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 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 (see section 13).

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid exposure - obtain special instructions before use.Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool place. 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.

7.3 Specific end uses

no data available

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. 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.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: light yellow
b)	Odour	no data available
c)	Odour Threshold	no data available
d)	pH	no data available
e)	Melting/freezing point	Melting point/range: 2 - 4 °C - lit.
f)	Initial boiling point and boiling range	56 - 58 °C at 33 hPa - lit.
g)	Flash point	46 °C - closed cup
h)	Evaporation rate	no data available
i)	Flammability (solid, gas)	no data available
j)	Upper/lower flammability or explosive limits	no data available
k)	Vapour pressure	33 hPa at 56 °C
l)	Vapour density	no data available
m)	Relative density	1,113 g/mL at 25 °C
n)	Water solubility	no data available
o)	Partition coefficient: n-octanol/water	no data available
p)	Autoignition temperature	no data available
q)	Decomposition temperature	no data available
r)	Viscosity	no data available
s)	Explosive properties	no data available
t)	Oxidizing properties	no data available

9.2 Other safety information

no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

no data available

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

no data available

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

no data available

10.6 Hazardous decomposition products

Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - rat - 78,0 mg/kg

LD50 Dermal - rabbit - 98,8 mg/kg

Skin corrosion/irritation
Skin - rabbit - Severe skin irritation - 24 h - Draize Test

Serious eye damage/eye irritation
Eyes - rabbit -

Respiratory or skin sensitization
May cause allergic respiratory reaction. May cause allergic skin reaction.

Germ cell mutagenicity
In vivo tests showed mutagenic effects

Genotoxicity in vitro - rat - Liver
Cytogenetic analysis

Genotoxicity in vitro - rat - Embryo
Morphological transformation.

Genotoxicity in vitro - rat - Liver
Sister chromatid exchange

Genotoxicity in vitro - mouse - lymphocyte
Cytogenetic analysis

Genotoxicity in vitro - mouse - S. typhimurium
Host-mediated assay

Genotoxicity in vitro - mouse - fibroblast
Morphological transformation.

Genotoxicity in vitro - mouse - Liver
Sister chromatid exchange

Genotoxicity in vitro - Human - lymphocyte
Mutation in mammalian somatic cells.

Genotoxicity in vitro - Human - lymphocyte
Sister chromatid exchange

Genotoxicity in vitro - Mammal - lymphocyte
DNA damage

Genotoxicity in vitro - Human - lymphocyte
Micronucleus test

Genotoxicity in vivo - rat - Subcutaneous
Cytogenetic analysis

Genotoxicity in vivo - mouse - Oral
Micronucleus test

Genotoxicity in vivo - mouse - Intraperitoneal
DNA damage

Genotoxicity in vivo - mouse - Intraperitoneal
Micronucleus test

Genotoxicity in vivo - mouse - Intraperitoneal
Mutation in mammalian somatic cells.

Genotoxicity in vivo - mouse - Intraperitoneal

Sister chromatid exchange

Genotoxicity in vivo - mouse - Intraperitoneal
sperm

Carcinogenicity

Carcinogenicity - rat - Inhalation
Tumorigenic:Neoplastic by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Tumors.

Carcinogenicity - rat - Intraperitoneal
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Musculoskeletal:Tumors. Tumorigenic:Tumors at site or application.

Possible human carcinogen

IARC:	2A - Group 2A: Probably carcinogenic to humans (2,2'-Bioxirane)
	2B - Group 2B: Possibly carcinogenic to humans (2,2'-Bioxirane)
IARC:	2B - Group 2B: Possibly carcinogenic to humans (Methylene chloride)
	2A - Group 2A: Probably carcinogenic to humans (2,2'-Bioxirane)
	2B - Group 2B: Possibly carcinogenic to humans (2,2'-Bioxirane)

Reproductive toxicity
no data available

Specific target organ toxicity - single exposure
no data available

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	May be fatal if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Ingestion	Toxic if swallowed. Causes burns.
Skin	May be fatal if absorbed through skin. Causes skin burns.
Eyes	Causes eye burns.

Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Additional Information
RTECS: Not available

12. ECOLOGICAL INFORMATION

12.1 Toxicity

no data available

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Results of PBT and vPvB assessment

no data available

12.6 Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

14.1 UN-Number

ADR/RID: 3384	IMDG: 3384	IATA: 3384

14.2 UN proper shipping name

ADR/RID:	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. (2,2'-Bioxirane)
IMDG:	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. (2,2'-Bioxirane)
IATA:	Toxic by inhalation liquid, flammable, n.o.s. (2,2'-Bioxirane)

Passenger Aircraft: Not permitted for transport
Cargo Aircraft: Not permitted for transport

14.3 Transport hazard class(es)

ADR/RID: 6.1 (3)	IMDG: 6.1 (3)	IATA: 6.1 (3)

14.4 Packaging group

ADR/RID: I	IMDG: I	IATA: -

14.5 Environmental hazards

ADR/RID: no	IMDG Marine pollutant: no	IATA: no

14.6 Special precautions for users

no data available

15. REGULATORY INFORMATION

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

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

no data available

15.2 Chemical Safety Assessment

no data available

16. OTHER INFORMATION

Further information

www.lookchem.com

For R&D use only. Not for drug, household or other uses.