

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations SDS Reference Number: 2109205 Issue date: 10/20/2021 Version: 1.0

SECTION 1 Identification

1.1. Product identifier

Product form : Substance

Substance name : 2,2-Difluoro-3,3-bis(trifluoromethyl)oxirane

CAS-No. : 707-13-1
Product code : 2109-2-05
Formula : C4F8O

1.2. Other means of identification

Other means of identification : MFCD00236667

1.3. Recommended use of the chemical and restrictions on use

Use of the substance/mixture : Laboratory chemicals, Manufacture of substances, Scientific research and development

1.4. Supplier's details

SynQuest Laboratories, Inc.

P.O. Box 309

Alachua, FL, Alachua, 32615

United States of America

T (386) 462-0788 - F (386) 462-7097

info@synquestlabs.com - www.synquestlabs.com

1.5. Emergency phone number

Emergency number : (844) 523-4086 (3E Company - Account 10069)

SECTION 2 Hazard Identification

2.1. Classification of the substance or mixture

GHS US classification

Gases under pressure : Liquefied gas	H280	Contains gas under pressure; may explode if heated.
Acute toxicity (inhalation), Category 4	H332	Harmful if inhaled.
Acute toxicity (inhalation:gas), Category 2	H331	Toxic if inhaled.
Skin corrosion/irritation, Category 2	H315	Causes skin irritation.
Serious eye damage/eye irritation, Category 2A	H319	Causes serious eye irritation.
Carcinogenicity, Category 2	H351	Suspected of causing cancer.
Specific target organ toxicity – Single exposure, Category 3,	H335	May cause respiratory irritation.
Despiratory tract instation		

Respiratory tract irritation

Specific target organ toxicity — Repeated exposure, Category 2 H373 May cause damage to organs through prolonged or repeated

exposure.

Full text of H statements : see section 16

2.2. Label elements

GHS US labeling

Hazard pictograms (GHS US)









Signal word (GHS US) : Danger

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Precautionary statements (GHS US)

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Hazard statements (GHS US) : H280 - Contains gas under pressure; may explode if heated

H315 - Causes skin irritation

H319 - Causes serious eye irritation

H331 - Toxic if inhaled

H332 - Harmful if inhaled

H335 - May cause respiratory irritation H351 - Suspected of causing cancer.

H373 - May cause damage to organs through prolonged or repeated exposure

: P201 - Obtain special instructions before use.

P202 - Do not handle until all safety precautions have been read and understood.

P260 - Do not breathe dust, fume, gas, mist, vapours, spray.
P264 - Wash hands, forearms and face thoroughly after handling.

P271 - Use only outdoors or in a well-ventilated area.

P280 - Wear protective gloves.

P302+P352 - If on skin: Wash with plenty of soap and water

P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact

lenses, if present and easy to do. Continue rinsing

P308+P313 - If exposed or concerned: Get medical advice/attention.

P311 - Call a POISON CENTER or doctor/physician

P312 - Call a POISON CENTER or doctor/physician if you feel unwell

P314 - Get medical advice or attention if you feel unwell.

P321 - Specific treatment (see supplemental first aid instruction on this label).

P332+P313 - If skin irritation occurs: Get medical advice or attention.
P337+P313 - If eye irritation persists: Get medical advice or attention.
P362+P364 - Take off contaminated clothing and wash it before reuse.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.

P405 - Store locked up.

P410+P403 - Protect from sunlight. Store in a well-ventilated place.

 $\ensuremath{\mathsf{P501}}$ - Dispose of contents and/or container to hazardous or special waste collection point, in

accordance with local, regional, national and/or international regulations.

2.3. Hazards associated with known or reasonably anticipated uses

No additional information available

2.4. Hazards not otherwise classified

Other hazards which do not result in classification : Risk of explosion if heated under confinement. May cause frostbite.

2.5. Unknown acute toxicity

No additional information available

SECTION 3 Composition/information on ingredients

3.1. Substances

Substance type : Mono-constituent

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Name	Product identifier	%	GHS US classification
2,2-Difluoro-3,3-bis(trifluoromethyl)oxirane (Main constituent)	CAS-No.: 707-13-1	≤ 100	Press. Gas (Liq.), H280 Acute Tox. 4 (Inhalation), H332 Acute Tox. 3 (Inhalation:gas), H331 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Carc. 2, H351 STOT SE 3, H335 STOT RE 2, H373

Full text of hazard classes and H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4 First aid measures

4.1. Description of necessary first-aid measures

First-aid measures general	: In case of accident or if you feel unwell, seek medical advice immediately (show the label where
	possible). Move the affected personnel away from the contaminated area.

First-aid measures after ingestion	: [Due to its physical form, exposure to this chemical is not likely. Do NOT induce vomiting. Never
	ç	give anything by mouth to an unconscious person. Rinse mouth out with water. Get immediate
	medical advice/attention.	

4.2. Most important symptoms/effects, acute and delayed

Symptoms/effects	: '	The most important known symptoms and effects are described in the labelling (see section 2.2)
	1	and/or in section 11.

Symptoms/effects after inhalation : May cause drowsiness or dizziness.

Symptoms/effects after skin contact : Contact with the liquid the may cause cold burns/frostbite.

Symptoms/effects after eye contact : Direct contact with the liquefied gas may cause severe and possibly permanent eye injury due to frostbite from rapid liquid evaporation.

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

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Alcohol resistant foam. Carbon dioxide. Dry powder. Water spray. Use extinguishing media appropriate for surrounding fire.

5.2. Specific hazards arising from the chemical

Fire hazard : Thermal decomposition generates: Carbon oxides. Hydrogen fluoride.

Explosion hazard : Contains gas under pressure; may explode if heated. Use water spray or fog for cooling exposed containers.

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5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection during firefighting : Wear gas tight chemically protective clothing in combination with self contained breathing

apparatus. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 6 Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate unnecessary personnel. Ensure adequate air ventilation. May cause suffocation by

reducing oxygen available for breathing. Do not breathe gas, fumes, vapor or spray.

For non-emergency personnel

Emergency procedures : Only qualified personnel equipped with suitable protective equipment may intervene.

For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer

to section 8: "Exposure controls/personal protection".

Emergency procedures : Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground

level.

Environmental precautions : Avoid release to the environment. Notify authorities if product enters sewers or public waters.

6.2. Methods and materials for containment and cleaning up

For containment : Stop leak if safe to do so.

Methods for cleaning up : Ventilate area.

Other information : For disposal of solid materials or residues refer to section 13 : "Disposal considerations".

For further information refer to section 8: "Exposure controls/personal protection"

SECTION 7 Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Ensure good

ventilation of the work station. Do not breathe fumes, gas, mist, spray, vapors. Wear personal

protective equipment. Avoid contact with skin and eyes.

Hygiene measures : Handle in accordance with good industrial hygiene and safety procedures. Do not eat, drink or

smoke when using this product. Always wash hands after handling the product.

Additional hazards when processed : Pressurized container: Do not pierce or burn, even after use. Close valve after each use and

when empty.

7.2. Conditions for safe storage, including incompatibilities

Technical measures : Comply with applicable regulations.

Storage conditions : Protect from sunlight. Do not expose to temperatures exceeding 50 °C. Keep container closed

when not in use.

Storage area : Store in dry, cool, well-ventilated area.

Incompatible materials : Refer to Section 10 on Incompatible Materials.

SECTION 8 Exposure controls/personal protection

8.1. Control parameters

No additional information available

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8.2. Appropiate engineering controls

Appropriate engineering controls

: Ensure good ventilation of the work station. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Systems under pressure should be regularily checked for leakage. Oxygen detectors should be used when asphyxiating gases may be released. Gas detectors should be used when toxic gases may be released.

8.3. Individual protection measures, such as personal protective equipment

Hand protection:

protective gloves. 29 CFR 1910.138: Hand Protection

Eve protection:

Chemical goggles or safety glasses. Face shield. 29 CFR 1910.133: Eye and Face Protection

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

In case of inadequate ventilation wear respiratory protection. 29 CFR 1910.134: Respiratory Protection

Personal protective equipment symbol(s):









Thermal hazard protection:

Cold insulating gloves.

Other information:

Safety shoes. 29 CFR 1910.136: Foot Protection.

SECTION 9 Physical and chemical properties

9.1. Basic physical and chemical properties

Physical state : Gas

Color: No data availableOdor: No data availableOdor threshold: No data availablepH: No data available

Melting point : -222 °C

Freezing point : No data available

Boiling point : 1-3 °C

Flash point No data available Flammability (solid, gas) : No data available : No data available Vapor pressure Relative vapor density at 20 °C : No data available Relative density : No data available Molecular mass : 216.0294 g/mol Solubility : No data available Partition coefficient n-octanol/water (Log Pow) : No data available Auto-ignition temperature : No data available No data available Decomposition temperature Viscosity, kinematic No data available **Explosion limits** No data available Particle characteristics No data available

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9.2. Data relevant with regard to physical hazard classes (supplemental)

No additional information available

SECTION 10 Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

The product is stable at normal handling and storage conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Protect from sunlight. Do not expose to temperatures exceeding 50 °C. Keep away from heat, sparks and flame.

10.5. Incompatible materials

Acids. DMSO. Metals. Oxidizing agents.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Hazardous decomposition products in case of fire, see Section 5.

SECTION 11 Toxicological information

11.1. Likely routes of exposure

Acute toxicity (oral) : No data available
Acute toxicity (dermal) : No data available
Acute toxicity (inhalation) : Inhalation:gas.

2,2-Difluoro-3,3-bis(trifluoromethyl)oxirane (707-13-1)

2,2 2 madro e,o sictamadromodify, oxiratio (101 101)		
ATE US (gases)	700 ppmV/4h	
ATE US (vapors)	11 mg/l/4h	
ATE US (dust, mist)	1.5 mg/l/4h	

Skin corrosion/irritation : Causes skin irritation.

Serious eye damage/irritation : Causes serious eye irritation.

Respiratory or skin sensitization : No data available Germ cell mutagenicity : No data available

Carcinogenicity : Suspected of causing cancer.

Reproductive toxicity : No data available

STOT-single exposure : May cause respiratory irritation.

STOT-repeated exposure : May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard : Not applicable

Symptoms/effects : The most important known symptoms and effects are described in the labelling (see section 2.2)

and/or in section 11.

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Symptoms/effects after inhalation : May cause drowsiness or dizziness.

Symptoms/effects after skin contact : Contact with the liquid the may cause cold burns/frostbite.

Symptoms/effects after eye contact : Direct contact with the liquefied gas may cause severe and possibly permanent eye injury due to

frostbite from rapid liquid evaporation.

SECTION 12 Ecological information

12.1. Ecotoxicity

Hazardous to the aquatic environment, short-term

(acute)

(chronic)

: No data available

Hazardous to the aquatic environment, long-term

the aquatic environment, long-term

: No data available

12.2. Persistence and degradability

2,2-Difluoro-3,3-bis(trifluoromethyl)oxirane (707-13-1)

Persistence and degradability Rapidly degradable

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Ozone : No data available

Fluorinated greenhouse gases : No

SECTION 13 Disposal considerations

Waste treatment methods

Sewage disposal recommendations

: See the EPA's Interim Guidance on PFAS Destruction and Disposal.

: Prevent runoff from entering drains, sewers or waterways. See the EPA's Interim Guidance on

PFAS Destruction and Disposal.

Product/Packaging disposal recommendations

Additional information

: See the EPA's Interim Guidance on PFAS Destruction and Disposal.

: EPA's Interim Guidance on PFAS Destruction and Disposal (Dec. 18, 2020 ||

https://downloads.regulations.gov/EPA-HQ-OLEM-2020-0527-0002/content.pdf). The National Defense Authorization Act for Fiscal Year 2020, Public Law No: 116-92 (hereafter, "FY 2020 NDAA"), was signed into law on December 19, 2019. Section 7361 of the FY 2020 NDAA directs the U.S. Environmental Protection Agency (EPA) to publish interim guidance on the destruction and disposal of perfluoroalkyl and polyfluoroalkyl substances (PFAS) and materials containing PFAS. This interim guidance fulfills that direction. EPA will review the interim guidance at least every 3 years and revise it, if appropriate based on the availability of new information or other factors.

SECTION 14 Transport information

14.1. UN number

 UN-No. (DOT)
 : UN3162

 UN-No. (TDG)
 : UN3162

 UN-No. (IMDG)
 : 3162

 UN-No. (IATA)
 : 3162

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14.2. UN Proper Shipping Name

Proper Shipping Name (DOT)

Proper Shipping Name (TDG)

Proper Shipping Name (IMDG)

Proper Shipping Name (IMDG)

Proper Shipping Name (IATA)

Liquefied gas, toxic, n.o.s.

Liquefied gas, toxic, n.o.s.

14.3. Transport hazard class(es)

DOT

Transport hazard class(es) (DOT) : 2.3 Hazard labels (DOT) : 2.3



TDG

Transport hazard class(es) (TDG) : 2.3 Hazard labels (TDG) : 2.3



IMDG

Transport hazard class(es) (IMDG) : 2.3 Hazard labels (IMDG) : 2.3



IATA

Transport hazard class(es) (IATA) : 2.3

14.4. Packing group

Packing group (DOT) : Not applicable
Packing group (TDG) : Not applicable
Packing group (IMDG) : Not applicable
Packing group (IATA) : Not applicable

14.5. Environmental hazards

Other information : No supplementary information available.

14.6. Transport in bulk

Not applicable

14.7. Special precautions for user

DOT

UN-No.(DOT) : UN3162

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DOT Special Provisions (49 CFR 172.102)

: 2 - This material is poisonous by inhalation (see 171.8 of this subchapter) in Hazard Zone B (see 173.116(a) or 173.133(a) of this subchapter), and must be described as an inhalation hazard under the provisions of this subchapter.

B9 - Bottom outlets are not authorized.

B14 - Each bulk packaging, except a tank car or a multi-unit-tank car tank, must be insulated with an insulating material so that the overall thermal conductance at 15.5 C (60 F) is no more than 1.5333 kilojoules per hour per square meter per degree Celsius (0.075 Btu per hour per square foot per degree Fahrenheit) temperature differential. Insulating materials must not promote corrosion to steel when wet.

DOT Packaging Non Bulk (49 CFR 173.xxx) : 304

DOT Packaging Bulk (49 CFR 173.xxx) : 314, 315

DOT Quantity Limitations Passenger aircraft/rail (49 : Forbidden

CFR 173.27)

DOT Quantity Limitations Cargo aircraft only (49

CFR 175.75)

DOT Vessel Stowage Location

: Forbidden

: D - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.

DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

TDG

UN-No. (TDG)

TDG Special Provisions

: UN3162

16 - 1) The technical name of the most dangerous substance related to the primary class must be shown, in parentheses, on the shipping document following the shipping name in accordance with clause 3.5(1)(c)(i)(A) of Part 3, Documentation. The technical name must also be shown, in parentheses, on a small means of containment or on a tag following the shipping name in accordance with subsections 4.11(2) and (3) of Part 4, Dangerous Goods Safety Marks. 2) subsection (1), the technical name for the following dangerous goods is not required to be shown on a shipping document or on a small means of containment when Canadian law for domestic transport or an international convention for international transport prohibits the disclosure of the technical: a) UN1544, ALKALOID SALTS, SOLID, N.O.S. or ALKALOIDS, SOLID, N.O.S; b) UN1851, MEDICINE, LIQUID, TOXIC, N.O.S; c) UN3140, ALKALOID SALTS, LIQUID, N.O.S. or ALKALOIDS, LIQUID, N.O.S; d) UN3248, MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S; or e) UN3249, MEDICINE, SOLID, TOXIC, N.O.S. An example in Canada is the "Food and Drugs Act",23 - 1) A consignor of these dangerous goods must include on a shipping document, after the classification of the dangerous goods, the words "toxic by inhalation" or toxic – inhalation hazard" or "toxique par inhalation" or "toxicité par inhalation" if the dangerous goods meet the criteria for inclusion in Class 6.1, Packing Group I, due to inhalation toxicity. For example: CYANIDE SOLUTION, N.O.S, Class 6.1, UN1935, PG I, toxic by inhalation 2) A person must not handle, offer for transport or transport these dangerous goods by passenger carrying road vehicle, passenger carrying railway vehicle or passenger carrying ship if they meet the criteria for inclusion in Class 6.1, Packing Group I, due to inhalation toxicity. 3) This special provision does not apply to a person who transports these dangerous goods in accordance with the exemption in section 1.15 of Part 1, Coming Into Force, Repeal, Interpretation, General Provisions and Special Cases, 38 - A person must not handle, offer for transport or transport these dangerous goods in a large means of containment if they are in direct contact with the large means of containment.

ERAP Index : 25
Explosive Limit and Limited Quantity Index : 0
Excepted quantities (TDG) : E0
Passenger Carrying Vessel Index : Forbidden

Passenger Carrying Road Vehicle or Passenger

Carrying Railway Vehicle Index

r · 123

: Forbidden

Emergency Response Guide (ERG) Number

IMDG

Special provision (IMDG) : 274

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Limited quantities (IMDG) : 0

Excepted quantities (IMDG) : E0

Packing instructions (IMDG) : P200

EmS-No. (Fire) : F-C - FIRE SCHEDULE Charlie - NON-FLAMMABLE GASES

EmS-No. (Spillage) : S-U - SPILLAGE SCHEDULE Uniform - GASES (FLAMMABLE, TOXIC OR CORROSIVE)

Stowage category (IMDG) : D Stowage and handling (IMDG) : SW2

IATA

Special provision (IATA) : A2 Forbidden PCA Limited quantities (IATA) PCA limited quantity max net quantity (IATA) Forbidden PCA packing instructions (IATA) Forbidden Forbidden PCA max net quantity (IATA) CAO packing instructions (IATA) : Forbidden : Forbidden CAO max net quantity (IATA) ERG code (IATA) : 2P

SECTION 15 Regulatory information

15.1. Federal regulations

All components of this product are present and listed as Active on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory, except for:

2,2-Difluoro-3,3-bis(trifluoromethyl)oxirane CAS-No. 707-13-1 100%

15.2. International regulations

CANADA

No additional information available

EU-Regulations

No additional information available

National regulations

No additional information available

15.3. State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16 Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations Issue date : 10/20/2021

Full text of hazard classes and H-statements			
H280	Contains gas under pressure; may explode if heated		
H315	Causes skin irritation		
H319	Causes serious eye irritation		
H331	Toxic if inhaled		
H332	Harmful if inhaled		

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Full text of hazard classes and H-statements			
H335	May cause respiratory irritation		
H351	Suspected of causing cancer.		
H373	May cause damage to organs through prolonged or repeated exposure		

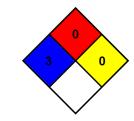
NFPA health hazard	:	3 - Materials that, under emergency conditions, can cause serious or
		nermanent injury

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and

sand.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire

conditions.



Hazard Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is

given

: * - Chronic (long-term) health effects may result from repeated overexposure

Flammability : 0 Minimal Hazard - Materials that will not burn Physical : 0 Minimal Hazard - Materials that are normally

: 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT

react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Safety Data Sheet (SDS), USA

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is offered solely for your consideration, investigation, and verification. It does not represent any guarantee of the properties of the product nor that the hazard precautions or procedures described are the only ones which exist. SynQuest shall not be held liable or any damage resulting from handling or from contact with the above product.