Chemical Safety Data Sheet MSDS / SDS

1,1-difluoroethylene 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: 1,1-difluoroethylene

CAS: 75-38-7

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

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

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SECTION 2: Hazards identification

Classification of the substance or mixture

Flammable gases, Category 1A, Flammable gas

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H220 Extremely flammable gas
H280 Contains gas under pressure; may explode if heated

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 In case of leakage, eliminate all ignition sources.

Storage

P403 Store in a well-ventilated place.

Disposal

none

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name: 1,1-difluoroethylene

Common names and synonyms: 1,1-difluoroethylene

CAS number:	75-38-7
EC number:	200-867-7
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest.

Following skin contact

ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

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/effects, acute and delayed

Excerpt from ERG Guide 116P [Gases - Flammable (Unstable)]: Vapors may cause dizziness or asphyxiation without warning. Some may be toxic if inhaled at high concentrations. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. Fire may produce irritating and/or toxic gases. (ERG, 2016)

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. Chlorinated fluorocarbons (CFCs) and related compounds

SECTION 5: Firefighting measures

Suitable extinguishing media

This chemical is a flammable gas. Poisonous gases are produced in fire including hydrogen fluoride, fluorine, and fluorides. Extinguish with CO2 or dry chemical to allow access to valves to shut off supply if necessary. Do not extinguish the fire unless the flow of gas can be stopped and any remaining gas is out of the line. Specially trained personnel may use fog lines to cool exposures and let the fire burn itself out. Vapors are heavier than air and will collect in low areas. Vapors may travel long distances to ignition sources and flashback. Vapors in confined areas may explode when exposed to fire. Containers may explode in fire. Storage containers and parts of containers may rocket great distances, in many directions. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Notify local health and fire officials and pollution control agencies. From a secure, explosion-proof location, use water spray to cool exposed containers. If cooling streams are ineffective (venting sound increases in volume and pitch, tank discolors or shows any signs of deforming), withdraw immediately to a secure position. If cylinders are exposed to excessive heat from fire or flame contact, withdraw immediately to a secure location.

Specific hazards arising from the chemical

Excerpt from ERG Guide 116P [Gases - Flammable (Unstable)]: EXTREMELY FLAMMABLE. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Silane (UN2203) will ignite spontaneously in air. Those substances designated with a (P) may polymerize explosively when heated or involved in a fire. Vapors from liquefied gas are initially heavier than air and spread along ground. Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. (ERG, 2016)

Special protective actions for fire-fighters

Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out. In other cases extinguish with powder, carbon dioxide. In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Ventilation. NEVER direct water jet on liquid. Personal protection: complete protective clothing including self-contained breathing apparatus.

Environmental precautions

Evacuate danger area! Consult an expert! Ventilation. NEVER direct water jet on liquid. Personal protection: complete protective clothing including self-contained breathing apparatus.

Methods and materials for containment and cleaning up

Evacuate danger area! Consult an expert! Ventilation. NEVER direct water jet on liquid.

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. Prevent build-up of electrostatic charges (e.g., by grounding) if in liquid state. Use non-sparking handtools. 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 incompatible materials. See Chemical Dangers. Store only if stabilized.Store gas cylinders in a cool, dry place and use the safety precautions necessary with all compressed gases. High concentrations cause a deficiency of oxygen with the risk of unconsciousness or death. Check oxygen content is at least 19% before entering storage or spill area. Store in tightly closed containers in a cool, well-ventilated area away from heat. Sources of ignition, such as smoking and open flames, are prohibited where this chemical is used, handled, or stored in a manner that could create a potential fire or explosion hazard. Use only nonsparking tools and equipment, expecially when opening and closing containers of this chemical ... A regulated, marked area should be established there this chemical is handled, used, or stored ...

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 500 ppm as TWA; A4 (not classifiable as a human carcinogen).MAK: carcinogen category: 3B

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.

Skin protection

Cold-insulating gloves. Protective clothing.

Respiratory protection

Use ventilation.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Gaseous. Gas.
Colour:	Colourless.
Odour:	Nearly odorless
Melting point/freezing point:	-144 °C. Atm. press.:1 atm.
Boiling point or initial boiling point and boiling range:	-83 °C. Atm. press.:1 atm.
Flammability:	Flammable Gas
Lower and upper explosion limit/flammability limit:	Lower flammable limit: 5.5% by volume; Upper flammable limit: 21.3% by volume
Flash point:	<= -65 °C.
Auto-ignition temperature:	640 °C.

Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	7.7574 pascal-seconds (liquid) at boiling point
Solubility:	0.018 g/100 g at 77° F and 760 mm Hg (NTP, 1992)
Partition coefficient n-octanol/water:	log Pow = 1.24.
Vapour pressure:	35 900 hPa. Temperature:20 °C.;40 000 hPa. Temperature:25 °C.
Density and/or relative density:	0.59. Temperature:23.6 °C.
Relative vapour density:	2.2 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

The substance can form explosive peroxides. The substance may polymerize. This generates a large amount of heat, with fire or explosion hazard. Heating may cause violent combustion or explosion. Decomposes on heating and on burning. This produces toxic and corrosive fumes including hydrogen fluoride, fluorine and fluorides. Reacts violently with oxidants and many other materials. This generates fire and explosion hazard.

Chemical stability

no data available

Possibility of hazardous reactions

Flammable, dangerous fire riskThe gas is heavier than air and may travel along the ground; distant ignition possible. The gas is heavier than air and may accumulate in lowered spaces causing a deficiency of oxygen. As a result of flow, agitation, etc., electrostatic charges can be generated.1,1-DIFLUOROETHYLENE is sensitive to heat. This compound is incompatible with oxidizers. It can react violently with hydrogen chloride. Alkyl boron and alkyl hyponitrite compounds initiate polymerization. It will form

peroxides on exposure to pure oxygen. (NTP, 1992).

Conditions to avoid

no data available

Incompatible materials

A very dangerous fire hazard when exposed to heat, flame, or oxidizers. Explosive in the form of vapor when exposed to heat or flame. Violent reaction with hydrgen chloride when heated under pressure ...

Hazardous decomposition products

The substance decomposes on heating or on burning producing toxic and corrosive fumes including hydrogen fluoride, fluorine and fluorides.

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

Inhalation: LCLo - rat (male/female) - > 200 000 ppm.

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

No epidemiological data relevant to the carcinogenicity of vinylidene fluoride were available. There is inadequate evidence for the carcinogenicity of vinylidene fluoride in experimental animals. Overall evaluation Vinylidene fluoride is not classifiable as to its carcinogenicity to humans (Group 3).

Reproductive toxicity

no data available

STOT-single exposure

Rapid evaporation of the liquid may cause frostbite. The substance may cause effects on the central nervous system.

STOT-repeated exposure

no data available

Aspiration hazard

A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 - freshwater fish - 246 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: LC50 - daphnids - 250 mg/L - 48 h.

Toxicity to algae: EC50 - green algae - 150 mg/L - 96 h.

Toxicity to microorganisms: no data available

Persistence and degradability

Highly chlorinated/fluorinated compounds are not expected to biodegrade rapidly(1).

Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for 1,1-difluoroethene(SRC), using a log Kow of 1.24(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 1,1-difluoroethene can be estimated to be 32(SRC). According to a classification scheme(2), this estimated Koc value suggests that 1,1-difluoroethene is expected to have very high 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: UN1959 (For reference only, please check.)
IMDG: UN1959 (For reference only, please check.)
IATA: UN1959 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: 1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R 1132a) (For reference only, please check.)

IMDG: 1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R 1132a) (For reference only, please check.)
IATA: 1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R 1132a) (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 2.1 (For reference only, please check.)
IMDG: 2.1 (For reference only, please check.)
IATA: 2.1 (For reference only, please check.)

Packing group, if applicable

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

Not Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

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/

Other Information

High concentrations in the air cause a deficiency of oxygen with the risk of unconsciousness or death. Check oxygen content before entering the area. Vapours are uninhibited and may form polymers in the vents or flame arresters causing blockage. Do NOT use in the vicinity of a fire or a hot surface, or during welding. Check for peroxides prior to distillation; eliminate if found. Turn leaking cylinder with the leak up to prevent escape of gas in liquid state. See ICSC 0083.