

Chemical Safety Data Sheet MSDS / SDS

1,1-difluoroethane SDS

Revision Date:2024-04-25 Revision Number:1

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

Product name: 1,1-difluoroethane
CAS: 75-37-6

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

Flammable gases, Category 1A, Flammable gas
Gases under pressure: Liquefied 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.

P410+P403 Protect from sunlight. 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-difluoroethane

Common names and synonyms:	1,1-difluoroethane
CAS number:	75-37-6
EC number:	200-866-1
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

Inhalation of concentrated gas will cause suffocation. Contact with liquid can damage eyes because of low temperature. Frostbite may result from contact with liquid. (USCG, 1999)

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 if 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

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Irritating hydrogen fluoride fumes may form in fire. Behavior in Fire: Containers may explode. Vapors are heavier than air and may travel a considerable distance to an ignition source and flash back. (USCG, 1999)

Special protective actions for fire-fighters

Use carbon dioxide, powder, water spray. 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

Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Ventilation. Remove vapour with fine water spray. NEVER direct water jet on liquid.

Environmental precautions

Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Ventilation. Remove vapour with fine water spray. NEVER direct water jet on liquid.

Methods and materials for containment and cleaning up

ACCIDENTAL RELEASE MEASURES: Personal precautions, protective equipment and emergency procedures: Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas; Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains; Methods and materials for containment and cleaning up: Clean up promptly by sweeping or vacuum.

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). 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. Keep in a well-ventilated room. Keep container tightly closed in a dry and well-ventilated place.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

no data available

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 or eye protection in combination with breathing protection.

Skin protection

Cold-insulating gloves.

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:	Odorless
Melting point/freezing point:	-117 °C. Atm. press.:Ca. 1 013 hPa.
Boiling point or initial boiling point and boiling range:	-24.7 °C. Atm. press.:Ca. 1 013 hPa.
Flammability:	Extremely flammable. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit:	Flammable limits in air 3.7-18%.
Flash point:	< -50 deg C (open cup)
Auto-ignition temperature:	440 °C. Atm. press.:100.9 - 101.7 kPa.
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	0.263 cP at 50 deg F
Solubility:	In water, 3.2X10+3 mg/L at 25 deg C
Partition coefficient n-octanol/water:	log Pow = 1.13. Temperature:25 °C.
Vapour pressure:	514 624 Pa. Temperature:25 °C. Remarks:3860 mm Hg.

Density and/or relative density:	Ca. 0.896. Temperature:25 °C.
Relative vapour density:	2.28 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes rapidly on heating and on burning. This produces toxic and irritating fumes including hydrogen fluoride and carbon monoxide. Reacts with amines, reducing agents, strong oxidants and epoxides.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

A very dangerous fire hazard when exposed to heat or flame; can react vigorously with oxidizing materials. The gas mixes well with air, explosive mixtures are easily formed. As a result of flow, agitation, etc., electrostatic charges can be generated. Halogenated aliphatic compounds, such as 1,1-DIFLUOROETHANE, are moderately or very reactive. Halogenated organics generally become less reactive as more of their hydrogen atoms are replaced with halogen atoms. Low molecular weight haloalkanes are highly flammable and can react with some metals to form dangerous products. Materials in this group are incompatible with strong oxidizing and reducing agents. Also, they are incompatible with many amines, nitrides, azo/diazo compounds, alkali metals, and epoxides. The reaction of aluminum with various halogenated hydrocarbons produces a self-sustaining reaction with sufficient heat to melt aluminum pieces, examples of other halogenated hydrocarbons are fluorotrichloromethane, dichlorodifluoromethane, chlorodifluoromethane, tetrafluoromethane. The vigor of the reaction appears to be dependent on the combined degree of fluorination and the vapor pressure [Chem. Eng. News 39(27):44(1961)].

Conditions to avoid

no data available

Incompatible materials

Incompatible materials: Alkali metals, Alkaline earth metals, Powdered metals, Powdered metal salts

Hazardous decomposition products

Special hazards arising from the substance or mixture: Carbon oxides, Hydrogen fluoride

SECTION 11: Toxicological information

Acute toxicity

Oral: Approximate Lethal Dose (ALD) - rat (male) - > 1 500 mg/kg bw. Remarks: Due to technical limitations, this was the maximum feasible dose tested.

Inhalation: LC50 - rat (male) - > 43.75 % (437500 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 data available

Reproductive toxicity

no data available

STOT-single exposure

Rapid evaporation of the liquid may cause frostbite. The substance may cause effects on the cardiovascular system. This may result in cardiac disorders. Exposure at high levels could cause unconsciousness.

STOT-repeated exposure

no data available

Aspiration hazard

On loss of containment this substance can cause suffocation by lowering the oxygen content of the air in confined areas.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 - Fish - 295.783 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnid - 146.695 mg/L - 48 h.

Toxicity to algae: EC50 - 168.276 mg/L - 96 h.

Toxicity to microorganisms: EC50 - Pseudomonas putida - > 730 mg/L - 6 h.

Persistence and degradability

no data available

Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for 1,1-difluoroethane(SRC), using a log Kow of 0.75(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-difluoroethane can be estimated to be 32(SRC). According to a classification scheme(2), this estimated Koc value suggests that 1,1-difluoroethane 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: UN1030 (For reference only, please check.)

IMDG: UN1030 (For reference only, please check.)

IATA: UN1030 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: 1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a) (For reference only, please check.)

IMDG: 1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a) (For reference only, please check.)

IATA: 1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a) (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)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

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

Turn leaking cylinder with the leak up to prevent escape of gas in liquid state. Check oxygen content before entering the area.

Disclaimer: 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 applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any