

FC13-5114i1,1,2,2-Tetrafluoroethyl-*iso*-Butyl Ether

Revised 19-December-2016

1. PRODUCT AND COMPANY IDENTIFICATION**Product Identifier**

Product name	1,1,2,2-Tetrafluoroethyl- <i>iso</i> -butyl ether
Catalog number	FC13-5114i
Brand	Fluoryx Labs
CAS no.	358-37-2

Relevant Identified uses of the Substance or mixture and Uses Advised Against

Identified uses	Laboratory chemicals. Manufacture of substances.
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Details of the Supplier of the Safety Data Sheet

Company	Fluoryx Labs 3650 Research Way, #22 Carson City, NV 89706 USA +1 (510) 329-9149 (Telephone) +1 (510) 686-8799 (Fax) www.fluoryx.com
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Emergency Call (ChemTel)

+01-813-248-0585 (International)
+1-800-255-3924 (USA)

2. HAZARDS INFORMATION**GHS Classification in Accordance with 29 CFR 1910 (OSHA HCS)**

Flammable liquid (Category 2)

GHS Label Elements, Including Precautionary Statements

Pictogram



Signal word

Danger

Hazard statement(s)

H225

Highly flammable liquid and vapor.

Precautionary statement(s)

P210

Keep away from heat/sparks/open flames/hot surfaces – No smoking.

P240

Ground/bond container and receiving equipment.

P242

Use only non-sparking tools.

P243

Take precautionary measures against static discharge.

P260

Do not breathe dust/fume/gas/mist/vapors/spray.

P271

Use only outdoors or in a well-ventilated area.

In case of inadequate ventilation wear respiratory protection.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Synonyms	HFE-5114i; 1,1,2,2-Tetrafluoro-1-ethoxy- <i>iso</i> -butane; <i>iso</i> -Butyl 1,1,2,2-tetrafluoroethyl ether; Ether, <i>iso</i> -butyl 1,1,2,2-tetrafluoroethyl
Chemical Formula	C ₆ H ₁₀ F ₄ O (CH ₃) ₂ CHCH ₂ OCF ₂ CF ₂ H
Molecular Weight	174.12
CAS No.	18180-34-2
EC No.	None

Hazardous Components

Component	Classification	Concentration
1,1,2,2-Tetrafluoroethyl- <i>iso</i> -butyl ether	Flam. Liq. 2; H225	≤100%

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

General advice	Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
If inhaled	If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact	Wash off with soap and plenty of water.
In case of eye contact	Flush eyes with water as a precaution.
If swallowed	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

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.
Special Hazards Arising from the Substance	Carbon oxides, hydrogen fluoride
Advice for Firefighters	Wear self-contained breathing apparatus for fire fighting if necessary.
Further Information	Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Use personal protective equipment. 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.
 For personal protection see section 8.

Environmental Precautions

Prevent further leakage or spillage if safe to do so.
 Do not let product enter drains. Discharge into the environment must be avoided.

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).

7. HANDLING AND STORAGE

Precautions for Safe Handling

Avoid contact with the substance. Provide appropriate exhaust ventilation at places where dust, mist or vapors are formed. Do not handle in a confined space. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for Safe Storage

Store in dry and cool place. Keep away from heat, sparks and flames. Containers that are opened must be carefully resealed and kept upright to prevent leakage.

Other Precautions:

No open flames or sparks, no smoking. Use electrically grounded equipment. Warn people about the dangers of the product. Prevent electrostatic discharges. Provide electrical equipment safety for hazardous locations.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Contains no substances with published occupational exposure limit values. However, inhalation exposure should be strictly limited.

Personal Protective Equipment

Respiratory protection

Use only in a chemical fume hood or local exhaust ventilation, and process enclosure if necessary to control exposure. Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (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).

Hand 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.

Eye protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and

Skin and body protection

approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Impervious clothing. 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.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	Liquid, clear
Color	Colorless

Safety Data

pH	No data available
Melting point/freezing point	No data available
Boiling point	93 °C @ 760 mm Hg
Flash point	4 °C, closed cup
Ignition temperature	No data available
Auto-ignition Temperature	No data available
Lower explosion limit	No data available
Upper explosion limit	No data available
Thermal decomposition temperature	No data available
Vapor pressure	No data available
Density	1.10 g/mL @ 27 °C
Water solubility	Negligible
Partition Coefficient (<i>n</i> -octanol/water)	No data available
Relative vapor density (air = 1)	No data available
Odor	Ethereal
Odor threshold	No data available
Evaporation rate	No data available

10. STABILITY AND REACTIVITY

Storage Stability	Stable under recommended storage conditions.
Possibility of Hazardous Reactions	Vapors may form explosive mixture with air.
Conditions to Avoid	Heat, flames and sparks. Extremes of temperature and direct sunlight. Keep dry.
Materials to Avoid	Oxidizing agents. Strong acids. Metallic powders. Alkaline metals. Metal halides.
Hazardous Decomposition Products	Hazardous decomposition products formed under fire conditions - carbon oxides, hydrogen fluoride, carbonyl fluoride.

11. TOXICOLOGICAL INFORMATION

Exposure Limits	None established
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Acute Toxicity	Oral: no data available Inhalation: no data available Dermal: no data available
Chronic Toxicity	No data available.
Skin Corrosion/Irritation	No data available.
Serious Eye Damage/Eye Irritation	No data available.
Respiratory or Skin Sensitization	No data available.
Germ Cell Mutagenicity	No data available.
Carcinogenicity	IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
Reproductive Toxicity	No data available
Tetragenicity	No data available
Specific Target Organ Toxicity (Globally Harmonized System)	
Single exposure	No data available
Repeated exposure	No data available
Aspiration Hazard	No data available
Potential Health Effects	
Inhalation	May be harmful if inhaled. May cause respiratory tract irritation. May cause dizziness.
Skin	May cause skin irritation.
Eyes	May cause eyes irritation.
Ingestion	May be harmful if swallowed.
Signs and Symptoms of Exposure	No data available
Synergistic Effects	No data available
Additional Information	No data available

12. ECOLOGICAL INFORMATION

Toxicity	No data available
Persistence and Degradability	No data available
Bioaccumulative Potential	No data available
Mobility in Soil	No data available
PBT and vPvB Assessment	No data available
Air, Photolysis,	ODP = 0. Result: no effect on stratospheric ozone. Reference value for CFC 11: ODP = 1.
Air, Greenhouse Effect	GWP = no data. Reference value for carbon dioxide:

GWP = 1.

Other Adverse Effects

No data available

13. DISPOSAL CONSIDERATIONS

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Contact a licensed professional waste disposal service to dispose of this material. Contact Fluoryx to return unused product.

Contaminated Packaging

Dispose of as unused product.

14. TRANSPORTATION INFORMATION

DOT (US)

UN1993
 Class 3
 Proper shipping name: Flammable Liquid, n.o.s. (Ethers)
 Packing group II
 Marine pollutant: No
 Poison inhalation hazard: No



Labeling: 3

IMDG

UN1993
 Class 3
 Proper shipping name: Flammable Liquid, n.o.s. (Ethers)
 Packing group II
 EMS-No: F-E, S-D
 Marine pollutant: No



Labeling: 3

IATA

UN1993
 Class 3
 Proper shipping name: Flammable Liquid, n.o.s. (Ethers)
 Packing group II



Labeling: 3

15. REGULATORY INFORMATION

OSHA Hazards

Flammable liquid.

TSCA Status	Not listed on US TSCA Inventory. It is for research and development use only.
DSL Status	The substance is not specified on any list.
SARA 302 Components	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313 Components	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
SARA 311/312 Hazards	Fire hazard. Threshold planning quantity: 10,000 lbs.
Massachusetts Right to Know Components	No components are subject to the Massachusetts Right to Know Act.
Pennsylvania Right to Know Components	No components are subject to the Pennsylvania Right to Know Act.
New Jersey Right to Know Components	No components are subject to the New Jersey Right to Know Act.
California Prop. 65 Components	This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full Text of H-Statements Referred to Under Sections 2 and 3.

Flam. Liq. H225	Flammable liquids Highly flammable liquid and vapor.
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HMIS Classification

Health hazard	1
Flammability	4
Physical hazards	0

NFPA Rating

Health hazard	1
Fire	4
Reactivity hazard	0

Further Information

Not for drug, household, or other uses. The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. Unless noted to the contrary, the technical information applies only to pure product.

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End of SDS