

Date: April 21, 2025 Rev. 2

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Unisolv-SC
Chemical Name: Methyl nonafluoroisobutyl ether; Hydrofluoro ether
Supplier Information: Unistar Chemical Inc.
425 Huehl Road, Bldg 1,
Northbrook, IL, 60062
1-847-724-8869
E-mail: info@unistarchemcal.com
Emergency Contact: (800) 424-9300 CHEMTREC

2. HAZARD IDENTIFICATION

Signal word: NOT APPLICABLE

Hazard Statements

No known Hazard.

Precautionary Statements**Prevention**

No special prevention

Response

No special response

Storage

No special storage.

Disposal

P501: Dispose of the contents/ container to the approved waste treatment plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	EC No.	CAS	Concentration (%)
Methyl nonafluoroisobutyl ether	605-340-9	163702-08-7	>99.0% (GC)

4. FIRST AID MEASURES

Inhalation:	Move wounded from the scene to the fresh air. Seek medical attention if feel unwell.
Skin contact:	Rinse the skin thoroughly with soapy water and plenty of water; Seek medical attention if symptoms/symptoms persist.
Eye contact:	Rinse immediately with plenty of water. If you have contact lenses and can easily remove them, remove the contact lenses. Continue rinsing. Seek medical attention if symptoms/symptoms persist.
Ingestion:	Seek medical attention/ consultation if feel unwell. Rinse mouth.
Notes to physician:	For physical and health hazards, respiratory protection, ventilation, and personal protective equipment, refer to other sections of this safety data sheet.

5. FIRE Extinguish Measures

Suitable extinguishing media:	Non-flammable; use a suitable extinguishing agent that extinguishes the surrounding fire.
Special fire extinguishing method:	Extinguish the fire from the upwind and choose the appropriate fire extinguishing method according to your surroundings. Unrelated personnel should evacuate to a safe place
Special fire danger may encounter when extinguishing:	Thermal decomposition might occur under high heat.
Hazardous combustion products:	

Substance	Conditions
CO	during combustion
CO ₂	during combustion
HF	during combustion or at rising temperature stage

Special Protective Equipment for Firefighters

When firefighting conditions are severe and the product may thermally decompose, wear full protective clothing, including a helmet, self-contained, positive pressure or pressure breathing apparatus, fireproof clothing and fireproof pants, arm, waist and leg straps, a face shield and a shield to protect other parts of the head that may be exposed.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Use personal protective equipment.
Emergency Procedures:	Keep away from spills/leaks and upwind. Ventilate workplace with fresh air.
Environmental precautions:	Avoid release into the environment. If there is a large spill, cover the sewer inlet and build a protective dike to prevent the spill from flowing into the sewer or water body environment.
Methods/materials for containment:	Collect the spill in a container. Clean up from the edge of the spill inward and cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Remember, adding absorbent materials does not eliminate physical, health or environmental hazards Collect as much of the spill as possible. In the event of a large spill, dike to contain it. Attachments or collections should be disposed of in accordance with relevant laws and regulations.

7. HANDLING AND STORAGE

Precautions for safe handling:	Do not inhale the thermal decomposition products. Avoid skin contact with thermally decomposable materials. For industrial or professional use only. Do not use in a confined space or where there is no air flow or minimal flow, and maintain good ventilation. Work clothes and other clothing, food and tobacco items shall be stored separately. Avoid release to the environment. Avoid contact with oxidizing agents (such as chlorine, chromic acid, etc.). No Smoking: Use of this product during smoking can contaminate tobacco and/or smoke, resulting in the formation of harmful decomposition products.
Conditions for safe storage:	Keep away from acid storage. Store away from strong bases. Store away from oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits				
Substance	CAS No.:	Institute	Limit	Remark
Methyl nonafluoroisobutyl ether	163702-08-7	AIHA	TWA:750 ppm	

AIHA: American Industrial Hygiene Association

TWA: time-weighted average allowable concentration

Engineering controls:	<p>Provide local exhaust equipment when heated.</p> <p>In the event that the liquid may come into contact with severe heat due to erroneous operation or equipment failure, a suitable sufficient local exhaust ventilation is used to bring the thermal decomposition product concentration below its contact limit.</p>
Eye/face protection:	Wear face protection if necessary.
Hand protection:	<p>Select and use gloves and/or protective clothing approved by relevant local standards to prevent skin contact based on exposure assessment results. Selection should be based on factors such as exposure levels, substance or mixture concentration, frequency and duration, physical challenges such as extreme temperatures, and other conditions of use. Consult the manufacturer of gloves and/or protective clothing to select the appropriate matching gloves and/or protective clothing.</p> <p>Gloves of the following materials are recommended: Nitrile rubber.</p> <p>Wear protective clothing if it is used in a highly exposed manner (eg spray, high splashing).</p> <p>Select and use body protection based on exposure assessment results to prevent contact. The following protective clothing is recommended: apron - nitrile</p>
Respiratory protection:	<p>Under normal use, the possibility of air exposure is very small and no respiratory protection is necessary.</p> <p>During heating: Use a positive pressure self-contained breathing apparatus if it is possible to come into contact with uncontrolled discharges, or if the exposure is unknown, and any potentially dangerous conditions and the air filter respirator does not provide adequate respiratory protection.</p>
Body protection:	Wear protective work clothes. Wear protective boots if necessary
Thermal hazards:	Wear insulated gloves when handling hot materials to avoid thermal burns.

9. PHYSICAL AND CHEMICAL PROPERTIES (NOT A SPECIFICATION)

Physical state	Liquid.
Appearance/Odor	Clear and colorless liquid with slight ether odor
pH value	Not applicable
Melting point/ freezing point (°C)	-135
Boiling point (°C)	59
Relative vapor density (kg/m ³)	8.6 (air = 1)
Relative density (g/ml)	1.5 (water = 1)
Saturation vapor pressure (kPa, 25°C)	28
Critical pressure (MPa)	No information available
Evaporation rate	49 (butyl acetate = 1)
Flash Point (°C)	Does not flash
n- octanol / water partition coefficient	3.9 (at 30 °C)
Surface tension dyn/cm	13.6
Latent heat of evaporation (kJ/kg)	112
Kinematic viscosity (cSt)	0.38
Solubility (ppm)	12 (at 25 °C)
Flammability	Non flammable
KB Value	10

10. STABILITY AND REACTIVITY

Reactivity:	Can react with some reagents under certain conditions-see other contents in this chapter.
Chemical stability:	Stable
Possibility of hazardous reactions:	No hazardous polymerization
Conditions to avoid:	No information available
Incompatible materials:	Strong oxidizer, strong acid and strong base

Hazardous decomposition Products:

Substance	Occurring conditions
CO	When temperature reaches an extremely high level
CO ₂	When temperature reaches an extremely high level
HF	When temperature reaches an extremely high level
Perfluoroisobutene (PFIB)	When temperature reaches an extremely high level
Toxic vapor, gas, dust	When temperature reaches an extremely high level

11. TOXICOLOGICAL INFORMATION

Acute dermal toxicity:	LD50>5000 mg·kg-1;
Acute inhalation toxicity:	no lethal dose LC50>20477.7 mg·m-3
Acute imported toxicity:	LD50>5000 mg·kg-1
Skin corrosion/irritation:	No irritation to rabbit skin.
Eyes:	No irritation to rabbit eyes.
Respiratory Tract Sensitization:	For this product component, no reference data are known or current data are insufficient for classification.
Skin Sensitization:	For this product component, no reference data are known or current data are insufficient for classification.
Germ Cell Mutagenicity:	For this product component, no reference data are known or current data are insufficient for classification.
Inhalation Hazard:	For this product component, no reference data are known or current data are insufficient for classification.

12. ECOLOGICAL INFORMATION

Acute Aquatic Hazard:	no aquatic toxicity according to GHS classification
Chronic Aquatic Hazard:	no aquatic toxicity according to GHS classification

Persistence and Degradability:

Substance	CAS No.	Test	Duration	Study type	Result	Guidelines
Methyl nonafluoroisobutyl ether	163702-08-7	Estimated Biodegradation	28 days	BOD	22 % BOD/ ThBOD	OECD Guideline for the Testing of Chemicals 301D - Closed Bottle Test

Mobility in soil: No information available

Potential Bioaccumulation:

Substance	CAS No.	Test	Study type	Result	Guidelines
Methyl nonafluoroisobutyl ether	163702-08-7	Estimated Bioaccumulation	Log Octanol/Water Separation Coefficient	4	Other

13. DISPOSAL CONSIDERATIONS

- a) Dispose of waste in a licensed industrial waste disposal facility.
- b) Incineration in a licensed waste incineration facility as one of the disposal methods of choice.
- c) Proper destruction may use additional fuel in the incineration process.
- d) Combustion products include hydrohalic acids (HCl/HF/HBr).
- e) Equipment must be able to handle halogenated materials.
- f) Empty drums/drummets/containers used for the transport and handling of hazardous chemicals (chemical substances/mixtures/preparations classified as hazardous under applicable regulations) should be stored, handled and disposed of as hazardous waste unless otherwise defined by the relevant regulations applicable to the waste.
- g) Consult each competent authority to determine available treatment and disposal facilities.

14. TRANSPORT INFORMATION

China Transport Hazard Class: Not applicable

UN regulation: Not Applicable

UN number: Not applicable

UN shipping name: Not applicable

IMO: Not applicable

IATA: Not applicable

Packing group: Not applicable

Marine pollutants (yes / no): No

Special Notes for Users: Not applicable

15. REGULATORY INFORMATION

This product complies with China's New Chemical Environmental Management Regulations and all components are listed or exempted from the Inventory of Existing Chemical Substances. This safety data sheet complies with the following national standards:

GB/T16483-2008	Chemical Safety Data Sheet Content and Item Sequence,
GB13690-2009	Chemical Classification and Hazard Publicity General Rules,
GB15258-2009	Regulations for the preparation of chemical safety labels,
GB6944-2005	Dangerous goods classification and product name number,
GB/T15098-2008	Classification method of packaging for transport of dangerous goods,
GB18218-2009	Identification of major hazard sources of hazardous chemicals,
GB190-2009	Dangerous Goods Packaging Mark,
GB/T191-2008	Graphical signs of packaging, storage and transportation,
GB12268-2012	Dangerous Goods List,
GA57-1993	Classification, classification and product name number of highly toxic substances,

GBZ/T210.1-2008	Occupational Hygiene Standard Formulation Guidelines Part 1 Occupational Exposure Limits for Chemical Substances in the Workplace,
GBZ/T210.2-2008	Occupational Hygiene Standard Development Guidelines Part 2 Occupational Exposure Limits for Dust in the Workplace
GBZ/T210.3-2008	Occupational Health Standards Formulation Guidelines Part 3 Occupational Exposure Limits for Physical Factors in the Workplace. and the following national regulations: "Dangerous Goods Regulations on the Administration of Transportation of Dangerous Goods", "Regulations on the Safety Management of Hazardous Chemicals" (Order No. 591 of the State Council), United Nations "Recommendations on the Transportation of Dangerous Goods" (UN RTDG).

16. OTHER INFORMATION

All substances present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. The information in this Safety Data Sheet represents the data available to us and the most appropriate use of this product under normal conditions of handling. However, we are not liable for any damages arising from the use of this product (except as required by law). This information may not apply if the user does not follow the instructions in this SDS or if the product is mixed with other materials. Therefore, it is important that the customer verify through testing that the product is suitable for his or her application. This product may be subject to PFAS product. It is user's responsibility to check and verify before using this product. Unistar Chemical is not responsible for any damage or injury caused by using this product.

Any technique problem about the MSDS, Enquire the Quality Department.

This SDS contents are based on the collected materials and information at the present.

Initial preparation date: 2018.01.15