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Material Safety Data Sheet

==========CHEMICAL PRODUCT/COMPANY IDENTIFICATION==========

Material Identification

Chemical Name: 1,1-DIFLUOROETHANE (HFC 152a)

CAS Number : 75-37-6

Formula : CH3CHF2

MANUFACTURER/DISTRIBUTOR

Zhejiang NOF Chemical Co., Ltd.

==========HAZARDS IDENTIFICATION==========

Potential Health Effects

Inhalation of HFC-152a may cause nonspecific discomfort such as nausea, headache or weakness, or temporary nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness.

Higher exposures may lead to irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath, temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation, or abnormal kidney function as detected by laboratory tests. Gross overexposure may be fatal.

Individuals with preexisting diseases of the central nervous system, cardiovascular system, lungs or kidney may have increased susceptibility to the toxicity of excessive exposures.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

==========FIRST AID MEASURES==========

First Aid

INHALATION

If high concentrations are inhaled, immediately remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Treat for frostbite if necessary, by gently warming affected area.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

Ingestion is not considered a potential route of exposure.

Notes to Physicians

Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution only in situations of emergency life

support.

==========FIRE FIGHTING MEASURES==========

 # Flammable Properties

Flash Point : <-50 C (<-58 F)

Flammable limits in Air, % by Volume

LEL : 3.9

UEL : 16.9

Autoignition : 454 C (849 F)

Fire and Explosion Hazards:

Flammable. Cylinders are equipped with temperature and pressure relief devices but may still rupture under fire conditions. Use water spray to cool cylinders and tanks.

HFC-152a fire decomposition by-products will include hydrofluoric acid, and possibly carbonyl fluoride. Avoid contact with these materials, which are toxic and irritating. Evacuate personnel immediately in the event of a fire involving HFC-152a.

Extinguishing Media

Water Spray, Water Fog, Dry Chemical. Carbon dioxide. "Alcohol" foam.

Fire Fighting Instructions

Keep container cool with water spray. If gas exiting container ignites, stop flow of gas. Do not put out the fire unless leak can be stopped immediately. Self-contained breathing apparatus (SCBA) is required if containers rupture and contents are released under fire conditions.

==========ACCIDENTAL RELEASE MEASURES==========

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Accidental Release Measures

If a spill can cause a concentration in excess of 1,000 ppm, turn off valves and ignition sources. Evacuate area. Ventilate area, especially low places where heavy vapors might collect. Wear self-contained breathing apparatus (SCBA).

If this product is spilled and not recovered, or is recovered as a waste for treatment or disposal, the CERCLA Reportable Quantity is 100 lbs. (Release of an unlisted Hazardous Waste characteristic of ignitability).

==========HANDLING AND STORAGE==========

Handling (Personnel)

Avoid breathing high concentrations of vapors and avoid liquid contact with skin or eyes. Use with sufficient ventilation to keep employee exposure below recommended limits. Lines and equipment which will contain R152a Aerosol Propellant should be pretested with nitrogen using soapy water to detect leaks.

Storage

Clean, dry area. Do not heat above 52 deg C 125 deg F.

==========EXPOSURE CONTROLS/PERSONAL PROTECTION==========

Engineering Controls

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust

should be used when large amounts are released. Mechanical exhaust should be used in low or enclosed places. Ground all equipment and cylinders before use. Use explosion-proof electrical equipment rated Class I, Group D in Division 1 locations. In Division 2 locations, all spark-producing electrical equipment must be
explosion-proof and rated Class I, Group D. Non-sparking motors need not be explosion-proof.

Personal Protective Equipment

Impervious gloves and chemical splash goggles should be worn when handling the liquid. Fire protective clothing (NOMEX) with antistatic control should be worn when handling this product. Under normal manufacturing conditions, no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large release occurs.

Exposure Guidelines

Exposure Limits

R152a AEROSOL PROPELLANT
PEL (OSHA) : None Established
TLV (ACGIH) : None Established
WEEL (AIHA) : 1000 ppm, 8 Hr. TWA

==========PHYSICAL AND CHEMICAL PROPERTIES==========

Physical Data

Boiling Point : -25 C (-13 F)
Vapor Pressure : 87 psia at 25 deg C (77 deg F)
Vapor Density : 2.4 (Air = 1.0)
at 25 deg C (77 deg F)
% Volatiles : 100 WT%
Solubility in Water : 0.28 WT% @ 25 C (77 F) (87 psia)
Odor : Slight ethereal
Form : Gas
Color : Clear, colorless
Density : 0.90 g/cc at 25 deg C (77 deg F) - Liquid

==========STABILITY AND REACTIVITY==========

Chemical Stability

Material is stable. However, avoid open flames and high temperatures.
Incompatibility with Other Materials
Incompatible with alkali or alkaline earth metals- powdered Al, Zn, Be, etc.

Polymerization

Polymerization will not occur.

Other Hazards

Decomposition : Decomposition products are hazardous.
This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrofluoric acid and possibly carbonyl fluoride.

==========TOXICOLOGICAL INFORMATION==========

Animal Data

Oral ALD: >1500 mg/kg in rats
Inhalation ALC, 4 hr: 383,000 ppm in rats

HFC-152a has not been tested for skin and eye irritancy, nor for animal sensitization.
Ingestion of single high doses of HFC-152a caused weight loss and lethargy.
Inhalation of high levels of HFC-152a caused labored breathing, lung irritation, lethargy, incoordination and loss of consciousness. Cardiac sensitization occurred in dogs exposed to a concentration of 150,000 ppm in air and given an intravenous epinephrine challenge.
Repeated inhalation exposures caused increased urinary fluoride, reduced kidney weight, and reversible kidney changes. Based on an independent peer review the reversible kidney changes are considered artifacts of the tissue and slide processing and not a compound related effect.
Animal testing demonstrate no carcinogenic activity nor developmental effects. No animal data are available to define reproductive effects of HFC-152a.
HFC-152a has not produced genetic damage in bacterial cultures. There are reports indicating that HFC-152a produced genetic damage in some mammalian cell culture tests. A weak genotoxic effect in germ cells of Drosophila melanogaster has been reported. It has not been tested in animals.

==========DISPOSAL CONSIDERATIONS==========

Waste Disposal

Reclaim by distillation, incinerate, or remove to a permitted waste facility. Comply with Federal, State, and local regulations.
This material may be a RCRA Hazardous waste upon disposal due to the ignitability characteristic.

==========TRANSPORTATION INFORMATION==========

Shipping Information

DOT/IMO
Proper Shipping Name : 1,1-DIFLUOROETHANE
Hazard Class : 2.1
UN No. : 1030
DOT/IMO Label : FLAMMABLE GAS
Special Information : CARGO AIRCRAFT ONLY
Shipping Containers
Cylinders Ton Tanks ISO tank

==========OTHER INFORMATION==========

NFPA, NPCA-HMIS
NPCA-HMIS Rating
Health : 1
Flammability : 4
Reactivity : 1
Personal Protection rating to be supplied by user depending on use conditions.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

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