R32 (Methylene fluoride)

Material Safety Data Sheet

Date Prepared: 27/07/2021

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT INFORMATION:
Name: R32
Use: Refrigerant
Formula: CH2F2

DISTRIBUTOR INFORMATION:
China Amines Co., Ltd
UNIT 1021, BEVERLEY COMMERCIAL CENTRE, 87-105CHATHAM ROAD SOUTH, TSIM SHA TSUI, KOWLOON
HONG KONG
Ph:+86 18938922889

EMERGENCY TELEPHONE NUMBER +86 18938922889

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components:

Material	**CAS Number**	**%**
Difluoromethane	75-10-5	100

3. HAZARDS IDENTIFICATION

3.1. Classification of the substance or mixture

Classification acc. to Regulation (EC) No 1272/2008/EC (CLP/GHS)
H220 - Flammable Gas Category 1, H280 - Pressurised Gas (Liquefied gas) - Contains gas under pressure; may explode if heated.
Flammable Gas 1- Extremely flammable gas.

Classification acc. to Directive 67/548/EEC & 1999/45/EC:
Proposed by the industry F+; R12
Extremely flammable.

Risk advice to man and the environment
Liquefied gas. Contact with liquid may cause cold burns/frost bite.

3.2. Label elements

- Labeling Pictograms

- Signal word
Danger

- Hazard Statements
H280 Contains gas under pressure; may explode if heated.
H220 Extremely flammable gas.

- Precautionary Statements

Precautionary Statement Prevention
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Precautionary Statement Response
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 Eliminate all ignition sources if safe to do so.

Precautionary Statement Storage
P403 Store in a well-ventilated place.

Precautionary Statement Disposal
None.

3.3. Other hazards
Contact with liquid may cause cold burns/frost bite.

4. FIRST AID MEASURES

4.1. Description of first aid measures

First Aid Inhalation:
Remove victim to uncontaminated area wearing self- contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First Aid Skin/Eye:
In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance. Immediately flush eyes thoroughly with water for at least 15 minutes.

First Aid Ingestion:
Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed
In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of coordination. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.

4.3. Indication of any immediate medical attention and special treatment needed
None

5. FIRE FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media
All known extinguishants can be used.

5.2. Special hazards arising from the substance or mixture

Specific hazards
Exposure to fire may cause containers to rupture/explode.

Hazardous combustion products
If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Hydrogen fluoride, Carbon monoxide, Carbonyl fluoride.

5.3. Advice for fire-fighters

Specific methods
If possible, stop flow of product. Move container away or cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Prevent water used in emergency cases from entering sewers and drainage systems.

Special protective equipment for fire-fighters
Use self-contained breathing apparatus and chemically protective clothing. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to EN 469 will provide a basic level of protection from chemical incidents. EN 469:2005: Protective clothing for fire-fighters. Performance requirements for protective clothing for fire-fighting.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
Consider the risk of potentially explosive atmospheres. Evacuate area. Ensure adequate air ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Eliminate ignition sources. Prevent from entering sewers, basements and work pits, or any place where its accumulation can be dangerous.

6.2. Environmental precautions
Try to stop release.

6.3. Methods and material for containment and cleaning up
Ventilate area. Keep area evacuated and free from ignition sources until any spilled liquid has evaporated (ground free from frost).

6.4. Reference to other sections
See also sections 8 and 13.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Only experienced and properly instructed persons should handle gases under pressure. The substance must be handled in accordance with good industrial hygiene and safety procedures. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Take precautionary measures against static discharges. Ensure equipment is adequately earthed. Purge air from system before introducing gas. Do not smoke while handling product. Assess the risk of potentially explosive atmosphere and the need for explosion-proof equipment. Consider the use of only non-sparking tools. Ensure the complete gas system has been (or is regularly) checked for leaks before use. Refer to supplier's handling instructions. Suck back of water into the container must be prevented. Do not allow back-feed into the container. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminates particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

7.2. Conditions for safe storage, including any incompatibilities

Observe all regulations and local requirements regarding storage of containers. Segregate from oxidant gases and other oxidants in store. Keep container below 50°C in a well ventilated place. Containers should be stored in the vertical position and properly secured to prevent falling over. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials. All electrical equipment in the storage areas should be compatible with the risk of potentially explosive atmosphere. Containers should not be stored in conditions likely to encourage corrosion.

7.3. Specific end use(s)

None.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limit value

Value type	Value	Note
TLV (ACGIH)	1,000 ppm	ACGIH 1995-1996

Derived No Effect Levels

Type	Exposure	Value	Population	Effects
DNEL	Long term Inhalation	7.035 mg/m^3	Workers	Systemic
DNEL	Long term Inhalation	750 mg/m^3	Consumers	Systemic

Predicted No Effect Concentrations

Type	Compartment Detail	Value
PNEC	Fresh water	0,142 mg/l
PNEC	Water (Intermittent release)	1,42 mg/l
PNEC	Fresh water sediment	0,534 mg/kg dw

8.2. Exposure controls

Appropriate engineering controls
A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Gas detectors should be used when quantities of flammable gases/vapours may be released. Consider work permit system e.g. for maintenance activities. Systems under pressure should be regularly checked for leakages. Provide adequate general or local ventilation. Keep concentrations well below occupational exposure limits. Product to be handled in a closed system. The substance must be handled in accordance with good industrial hygiene and safety procedures.

Personal protective equipment

Eye and face protection
Wear a face-shield when trans-filling and breaking transfer connections. Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases.

Skin protection

Hand protection
Advice: Wear cold insulating gloves. Guideline: EN 511 Protective gloves against cold.
Body protection
Protect eyes, face and skin from contact with product.
Other protection
Wear flame resistant/retardant clothing. Take precautionary measures against static discharges. Wear working gloves and safety shoes while handling gas cylinders. ISO 20345 Safety footwear.

Thermal hazards
If there is a risk of contact with the liquid, all protective equipment should be suitable for extremely low temperatures

Environmental Exposure Controls
Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

General information

Appearance/Colour: Colourless gas.
Odour: Ethereal Poor warning properties at low concentrations.
Odour threshold: Odour threshold is subjective and inadequate to warn for over exposure.
Melting point: -136 °C
Boiling point: -51.7 °C
Flash point: Not applicable for gases and gas mixtures.
Evaporation rate: Not applicable for gases and gas mixtures.
Flammability range: 14 %(V) - 33 %(V)
Vapour Pressure 20 °C: 13.8 bar
Relative density, gas: 1.8
Relative density, liquid: 1.1
Solubility in water: 280000 mg/l
Partition coefficient: n-octanol/water: 0.2 logPow
Auto-ignition temperature: 648 °C
Molecular weight: 52,024 g/mol
Critical temperature: 78.4 °C
Critical pressure: 58.1 bar

9.2. Other information
Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10. STABILITY AND REACTIVITY

10.1. Reactivity
Unreactive under normal conditions.
10.2. Chemical stability
Stable under normal conditions.
10.3. Possibility of hazardous reactions
Can form potential explosive atmosphere in air. May react violently with oxidants.
10.4. Conditions to avoid
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
10.5. Incompatible materials
Air, Oxidiser. Moisture. May react violently with alkaline-earth and alkali metals.
10.6. Hazardous decomposition products
Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Hydrogen fluoride, Carbonyl fluoride, Carbon monoxide.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute oral toxicity
Not applicable.
Acute inhalation toxicity
Value: LC50
Species: Rat
Value in non-standard unit: 520,000 ppm
Irregular cardiac activity., Depression of central nervous system.
Acute dermal toxicity
Not applicable.
Acute toxicity other routes
Ingestion is not considered a potential route of exposure.
Skin irritation
Not classified as an irritant.
Eye irritation
Not classified as an irritant.
Sensitisation
This substance is not classified as a sensitiser.
Repeated dose toxicity
Species: Rat
Value type: NOAEL
Value: 50,000 ppm
Exposure time: 3 months
Route of application: Inhalation
No known effects from this product.
Genetic toxicity in vitro
Test type: Ames test in vitro:
Method: OECD Test Guideline 471
Inactive.
Test type: In vitro chromosomal abnormality test on human lymphocytes:
Method: OECD Test Guideline 473
Inactive.
Test type: In vitro gene mutations test on mammalian cells:
Method: OECD Test Guideline 476
Inactive.
Genetic toxicity in vivo
Test type: Micronucleus test in vivo mouse:
Method: OECD Test Guideline 474
Result: Inactive.

Assessment mutagenicity
There is no evidence of mutagenic potential.
Assessment carcinogenicity
No evidence of carcinogenic effects.
Toxicity to reproduction/fertility
Species: Mouse
Value type: NOAEL
Value: 50,000 ppm
Route of application: Inhalation
Assessment toxicity to reproduction
No indication of toxic effects.
Developmental toxicity/teratogenicity
Species: Rabbit
Value type: NOAEL
Value: 50,000 ppm
Route of application: Inhalation

12. ECOLOGICAL INFORMATION

12.1. Toxicity
When discharged in large quantities may contribute to the greenhouse effect.

Acute and prolonged toxicity fish
Species: Various (Freshwater)
Exposure time: 96 h
Value type: LC50
Value in standard unit mg/l: 1.057 mg/l
Method: Calculated
Not harmful to fish.

Acute toxicity aquatic invertebrates
Species: Daphnia magna
Exposure time: 48 h
Value type: EC50
Value in standard unit mg/l: 652 mg/l
Method: Calculated
Harmful to invertebrates.

Toxicity aquatic plants
Species: Algae
Exposure time: 96 h
Value type: EC50
Value in standard unit mg/l: 142 mg/l
Method: Calculated
Harmful to algae.

12.2. Persistence and degradability
Aerobic 3,38 mg/l /28 d
Biodegradation: 5 %
Not readily biodegradable.
Photo degradation
Half life (direct photolysis): 1.237 d
Degradation by radicals OH.

12.3. Bioaccumulative potential
Log Kow: 0,21
Because of the partition coefficient of the contaminant in the organic fraction of the soil (log Kow), accumulation in organisms is not to be expected.

12.4. Mobility in soil
Distribution among environmental compartments :
Water: 0.01 %
Air: 99.99 % (Method: Calculation according Mackay, Level I)
Henry constant: 29.60E+03 Pa.m3/mol, (Method: calculated)
Absorption/desorption: In soils and sediments: Slight adsorption, log Koc: 0.17–1.34 (Method: calculated)

12.5. Results of PBT and vPvB assessment
Not classified as PBT or vPvB.

12.6. Other adverse effects
Global Warming Potential - Contains fluorinated greenhouse gases covered by the Kyoto protocol. 550

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods
Avoid discharge to atmosphere. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Do not discharge into any place where its accumulation could be dangerous. Contact supplier if guidance is required. EWC Nr. 16 05 04*

14. TRANSPORTATION INFORMATION

ADR/RID
14.1. UN number
3252
14.2. UN proper shipping name
DIFLUOROMETHANE (REFRIGERANT GAS R 32)
14.3. Transport hazard class(es)
Class: 2
Classification Code: 2F
Labels: 2.1

Hazard number: 23
Tunnel restriction code: (B/D)
Emergency Action Code: 2YE
14.4. Packing group (Packing Instruction)
P200
14.5. Environmental hazards
None.
14.6. Special precautions for user
None.

IMDG
14.1. UN number
3252
14.2. UN proper shipping name
DIFLUOROMETHANE (REFRIGERANT GAS R 32)
14.3. Transport hazard class(es)
Class: 2.1
Labels: 2.1
EmS: F-D,S-U
14.4. Packing group (Packing Instruction)
P200
14.5. Environmental hazards
None.
14.6. Special precautions for user
None.
14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

IATA
14.1. UN number
3252
14.2. UN proper shipping name
DIFLUOROMETHANE (REFRIGERANT GAS R 32)
14.3. Transport hazard class(es)
Class: 2.1
Labels: 2.1
14.4. Packing group (Packing Instruction)
P200
14.5. Environmental hazards
None.
14.6. Special precautions for user
None.

Other transport information
Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the cylinder valve is closed and not leaking. Ensure that the valve outlet cap nut or plug (where provided) is correctly fitted. Ensure that the valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations.

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance
Seveso Directive 96/82/EC: Covered

Other regulations
Regulation on Fluorinated greenhouse gases 842/2006/EC: Listed.

15.2. Chemical safety assessment
A CSA does not need to be carried out for this product.

16. OTHER INFORMATION

Ensure all national/local regulations are observed. Ensure operators understand the flammability hazard. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Advice
Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press.

End of MSDS