

ORAFON HFC-23

MATERIAL SAFETY DATA SHEET (MSDS)

ORAFON HFC-23

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name : ORAFON HFC-23
Supplier : ORANOSS CO., LTD.
Address : 89 Moo 12, Soi Raikhing 42, Phutthamonthon Sai 5 Road., Tambol Raikhing, Ampur Sampran, Nakhonpathom 73210 Thailand
Emergency Phone : Tel : +66 (0) 2105 0499 (Auto) Fax : +66 (0) 2105 0490

2. HAZARDS IDENTIFICATION

GHS classification

Classification of the substance or mixture : GASES UNDER PRESSURE - Liquefied gas

GHS label elements

Hazard Pictograms

Signal Word : Warning

Hazard Statements

Contains gas under pressure; may explode if heated.
May cause frostbite.
May displace oxygen and cause rapid suffocation.

Precautionary Statements

Prevention : Use and store only outdoors or in a well ventilated place.
Response : Not applicable.
Storage : Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well ventilated place.
Disposal : Not applicable.

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Chemical name | CAS No. | Percent |
|------------------|---------|---------|
| Trifluoromethane | 75-46-7 | 100 % |

4. FIRST AID MEASURES

Fist Aid Procedures

Skin : Allow to evaporate.
Rinse with lukewarm running water.
If symptoms persist, call a physician.

Eyes : Keep eyelids open to allow evaporation of product.
Flush eyes with running water for several minutes, while keeping the eyelids wide open.
If eye irritation persists, consult a specialist.

Inhalation : Remove to fresh air.
Oxygen or cardiopulmonary resuscitation if necessary.
If symptoms persist, call a physician.

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

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Extinguishing media which must not be used for safety reasons

None.

Special exposure hazards in a fire

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The product is not flammable.
Hazardous decomposition products.

Special protective equipment for fire-fighters

Evacuate personnel to safe areas.
Wear self-contained breathing apparatus and protective suit.
When intervention in close proximity wear acid resistant over suit.
Clean contaminated surface thoroughly.

Other information

If safe to do so, remove the exposed containers, or cool with large quantities of water.
As for any fire, ventilate and clean the rooms before re-entry.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Refer to protective measures listed in sections 7 and 8.
Ventilate the area.
Prevent further leakage or spillage if safe to do so.
Keep away from incompatible products

Environmental precautions

Should not be released into the environment.

Methods and material for containment and cleaning up

Allow to evaporate.
Prevent product from entering drains.

7. HANDLING AND STORAGE

Handling

Use only in well-ventilated areas.
Prevent product vapours decomposition from contacting hot spots.
Prevent product vapours decomposition from electric arc action (welding).
Use only equipment and materials which are compatible with the product.
Keep away from heat and sources of ignition.
Keep away from incompatible products

Storage

Keep in a cool, well-ventilated place.
Keep away from heat.
Keep away from incompatible products

Packaging material Steel Cylinder

Other information Warn people about the dangers of the product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure controls:

Ensure adequate ventilation.
Apply technical measures to comply with the occupational exposure limits.

Appropriate engineering controls:

Individual protection measures, such as personal protective equipment:

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.
Self-contained breathing apparatus in medium confinement/insufficient oxygen/in case large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
Use only respiratory protection that conforms to international/ national standards.

Hand protection

Wear suitable gloves.
Recommended materials: Polyvinyl alcohol

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Eye protection

Chemical resistant goggles must be worn.
If risk of splashing, chemical proof goggles/face shield.

Skin and body protection

Apron/boots of neoprene if risk of splashing.

Hygiene measures

Shower and eye wash stations.
Gloves, overalls and boots have to be double layered (protection against cold temperature).

Environmental exposure controls

Dispose of rinse water in accordance with local and national regulations.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|--|--|
| Appearance | Compressed liquefied gas |
| Color | Colourless |
| Odor | ether-like |
| pH | Remarks: neutral |
| Boiling point/range | -82.1 °C |
| Flash point | no data available |
| Oxidizing properties | Non oxidizer |
| Vapour pressure | 41.85 bar Temperature: 20°C |
| Relative density / Density | 0.62 |
| Solubility | Water = 1,001 g/l Temperature: 20 °C Remarks: Pressure = 1 bar |
| Partition coefficient (n-octanol/water) | no data available |
| Viscosity | Dynamic viscosity (liquid) 0.106 mPa.s Temperature: 25 °C |
| Vapour density | 2.4 |
| Freezing point: | -155 °C |

10. STABILITY AND REACTIVITY

| | |
|---|---|
| Chemical stability | Strong oxidizers, alkali metals and alkaline earth metals may cause fires or explosions. Vapours are heavier than air and may spread along floors. |
| Conditions to avoid | Heat. |
| Incompatible materials | Light and/or alkaline metals |
| Hazardous decomposition products | Hydrogen fluoride, Fluorophosgene |

11. TOXICOLOGICAL INFORMATION

| | |
|-----------------------------------|---|
| Toxicological data | |
| Acute oral toxicity | LD50, Remarks: not applicable |
| Acute inhalation toxicity | LC0, 2 h, rat, 0.573 g/l |
| Acute dermal toxicity | LD50, Remarks: not applicable |
| Irritation (other route) | No irritation signs noted during toxicity testing. |
| Sensitization | No data |
| Chronic toxicity | Inhalation, Repeated exposure, rat, NOEL: 1 %, no observed effect Inhalation, Repeated exposure, dog, NOEL: 0.50 %, no observed effect |
| Possible hazards (summary) | No appreciable toxic effect Ambiguous mutagenic effect |
| Health effects | |
| Inhalation | At high concentrations, risk of asphyxia by lack of oxygen. |
| Eye contact | (gas) Risk of moderate consequences experimentally observed or under certain conditions. (Liquefied gas) Severe eye irritation, watering, redness and swelling of the eyelids. Risk of burns (frostbite). |
| Skin contact | (gas) Negligible (liquefied gas) Cold sensation followed by redness of the skin. May cause frostbite. |
| Ingestion | Impossible risk (gas). |

12. ECOLOGICAL INFORMATION

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Ecotoxicity effects

Acute toxicity no data available
Chronic toxicity no data available

Mobility

Air, Henry's law constant (H) ca. 290 kPa.m³/mol
Conditions: 20 °C / calculated value
Remarks: considerable volatility
Soil/sediments, adsorption, log KOC: from 1.66 - 2.04
Conditions: calculated value

Persistence and degradability

Biodegradation no data available

Bioaccumulative potential no data available

Other adverse effects

Ozone Depletion Potential:

Ozone depletion potential; ODP; (R-11 = 1) = 0
Result: no effect on stratospheric ozone
Remarks: Ozone depletion potential; ODP; (R-11 = 1)

Global Warming Potential:

GWP ca. 6
Remarks: Halocarbon global warming potential; HGWP; (R-11 = 1)

Possible hazards (summary)

Product is persistent in air.

13. DISPOSABLE CONSIDERATIONS

Waste from residues / unused products

In accordance with local and national regulations.
Refer to manufacturer/supplier for information on recovery/recycling.

Packaging treatment

To avoid treatments, as far as possible, use dedicated containers.

14. DISPOSABLE CONSIDERATIONS

IATA-DGR

Basic shipping requirements:
UN number 1984
Proper shipping name TRIFLUOROMETHANE
Hazard class 2.2
Labels NON FLAMMABLE GAS

15. REGULATORY INFORMATION

Not classified according to Directive 67/548/EEC.

16. OTHER INFORMATION

The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product that conforms to the specification, unless otherwise stated. In the case of combinations and mixtures one must make sure that no new dangers can arise. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and environment.

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