SECTION 1: Identification

1.1. Product identifiers

Product Code: kumi3F39
Substance name: Methyl Difluoro(fluorosulfonyl)acetate
Synonym: Methyl 2,2-difluoro-2-(fluorosulfonyl)acetate, MFSDA
Trademark: Fluora
CAS No.: 680-14-9
Formula: C₃H₃F₃O₄S
Reach No.: Exempted from registration

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified Uses:
- Laboratory chemicals
- Manufacture of substances
- Scientific research and development

1.3. Details of the supplier of the safety data sheet

Kumidas SA
Avenue Louise 279, 1050 Brussels, Belgium
T: +32(0) 2 699 82 36 F: +32(0) 2 699 82 36 40
E: info@kumidas.com W: www.kumidas.com

1.4. Emergency telephone number

Emergency Phone#: +32(0)484 58 71 75

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008
- Flammable liquids (Category 3), H226
- Skin corrosion (Category 1B), H314

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

2.2. Label elements

Labeling according to Regulation (EC) No 1272/2008

Hazard pictograms:

- Danger

Signal word: Danger
Hazard statements:
- H226 – Flammable liquid and vapour.
- H314 – Causes severe skin burns and eye damage.

Precautionary statements:
- P280 – Wear protective gloves/protective clothing/eye protection/face protection.
- P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P310 – Immediately call a POISON CENTER/doctor.

Supplemental Hazard Statements (EU):
None

2.3. Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Strong hydrogen fluoride releaser
Methyl Difluoro(fluorosulfonyl)acetate
Safety Data Sheet

SECTION 3: Composition/information on ingredients

3.1. Substances
Substance type: Mono-constituent
Formula: C₃H₃F₃O₄S
Molecular weight: 192.11 g/mol

Hazardous ingredients according to Regulation (EC) No.1272/2008

<table>
<thead>
<tr>
<th>Component</th>
<th>Product identifier</th>
<th>Concentration</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl Difluoro(fluorosulfonyl)acetate</td>
<td>(CAS No.) 681-15-9</td>
<td>≤ 200%</td>
<td>Flam. Liq. 3, H226</td>
</tr>
<tr>
<td>(Main constituent)</td>
<td></td>
<td></td>
<td>Skin Corr. 1B, H314</td>
</tr>
</tbody>
</table>

Full text of H-statements: see section 16

3.2. Mixture
Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Hydrofluoric (HF) acid burns require immediate and specialized first aid and medical treatment. Symptoms may be delayed up to 24 hours depending on the concentration of HF. After decontamination with water, further damage can occur due to penetration/absorption of the fluoride ion. Treatment should be directed toward binding the fluoride ion as well as the effects of exposure. Skin exposures can be treated with a 2.5% calcium gluconate gel repeated until burning ceases. More serious skin exposures may require subcutaneous calcium gluconate except for digital areas unless the physician is experienced in this technique, due to the potential for tissue injury from increased pressure. Absorption can readily occur through the subungual areas and should be considered when undergoing decontamination. Prevention of absorption of the fluoride ion in cases of ingestion can be obtained by giving milk, chewable calcium carbonate tablets or Milk of Magnesia to conscious victims. Conditions such as hypocalcemia, hypomagnesemia and cardiac arrhythmias should be monitored for, since they can occur after exposure. Consult a physician. Show this safety data sheet to the doctor in attendance. Hydrofluoric (HF) acid burns require immediate and specialized first aid and medical treatment. Symptoms may be delayed up to 24 hours depending on the concentration of HF. After decontamination with water, further damage can occur due to penetration/absorption of the fluoride ion. Treatment should be directed toward binding the fluoride ion as well as the effects of exposure. Skin exposures can be treated with a 2.5% calcium gluconate gel repeated until burning ceases. More serious skin exposures may require subcutaneous calcium gluconate except for digital areas unless the physician is experienced in this technique, due to the potential for tissue injury from increased pressure. Absorption can readily occur through the subungual areas and should be considered when undergoing decontamination. Prevention of absorption of the fluoride ion in cases of ingestion can be obtained by giving milk, chewable calcium carbonate tablets or Milk of Magnesia to conscious victims. Conditions such as hypocalcemia, hypomagnesemia and cardiac arrhythmias should be monitored for, since they can occur after exposure.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician. First treatment with calcium gluconate paste.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

4.3. Indication of any immediate medical attention and special treatment needed
Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2. Special hazards arising from the substance or mixture
No data available.
Methyl Difluoro(fluorosulfonyl)acetate
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5.3. Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4. Further information
Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2. 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.

6.3. Methods and material for containment and cleaning up
Sweep up and shovel. 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). Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

6.4. Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition- No smoking. Take measures to prevent the build up of electrostatic charge. For precautions see section 2.2.

7.2. Conditions for safe storage, including any incompatibilities
Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Moisture sensitive. Do not store in glass.

7.3. Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2. Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product.

Personal protective equipment
Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin 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.
The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body protection
Complete suit protecting against chemicals, Flame retardant protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) 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).

Control of environment exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear, Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Dark Brown</td>
</tr>
<tr>
<td>Odor</td>
<td>No data available</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>117-118 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>47°C– closed cup</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.509 g/cm³ at 25 °C</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>No data available</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>192.11 g/mol</td>
</tr>
<tr>
<td>Solubility</td>
<td>No data available</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
</tbody>
</table>

9.2. Other safety information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

The product is stable at normal handling and recommended storage conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Heat, flames and sparks. Reacts dangerously with glass.

10.5. Incompatible materials

Strong oxidizing agents. Glass.

10.6. Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sulphur oxides, Hydrogen fluoride.

Other decomposition products – No data available.

In the event of fire: see section 5.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>No data available</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Causes skin corrosion.</td>
</tr>
<tr>
<td>Serious eye damage/irritation</td>
<td>May cause Severe eye irritation</td>
</tr>
</tbody>
</table>
Methyl Difluoro(fluorosulfonyl)acetate
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Respiratory or skin sensitization: No data available
Germ cell mutagenicity: No data available
Carcinogenicity: 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.
Reproductive toxicity: No data available
Specific target organ toxicity (single exposure): No data available
Specific target organ toxicity (repeated exposure): No data available
Aspiration hazard: No data available
Additional information: RTECS: Not available

Fluoride ion can reduce serum calcium levels possibly causing fatal hypocalcemia. Material reacts with moisture on the skin, eyes, and mucous membranes to generate hydrogen fluoride. Hydrogen fluoride is extremely destructive and may cause deep progressive burns that induce subcutaneous tissues to become blanched and bloodless resulting in lesions of dead tissue that are slow to heal.

SECTION 12: Ecological information

12.1. Toxicity
No additional information available

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential
No additional information available

12.4. Mobility in soil
No additional information available

12.5. Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6. Other adverse effects
No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

14.1. UN number
ADR/RID: 2920
IMDG: 2920
IATA: 2920

14.2. UN proper shipping name
ADR/RID: CORROSIVE LIQUID, FLAMMABLE, N.O.S. (Methyl Difluoro(fluorosulfonyl)acetate)
IMDG: CORROSIVE LIQUID, FLAMMABLE, N.O.S. (Methyl Difluoro(fluorosulfonyl)acetate)
IATA: Corrosive liquid, flammable, n.o.s. (Methyl Difluoro(fluorosulfonyl)acetate)

14.3. Transport hazard class (es)
ADR/RID: 8(3)
IMDG: 8(3)
IATA: 8(3)

14.4. Packaging group
ADR/RID: II
IMDG: II
IATA: II

14.5. Environmental hazards
ADR/RID: no
IMDG: Marine pollutant: no
IATA: no
Methyl Difluoro(fluorosulfonyl)acetate

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14.6. Special precautions for user

No data available

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

International Chemical Weapons Convention (CWC) Schedules of Toxic Chemicals and Precursors:

Neither banned nor restricted

Restrictions on the marketing and use of certain dangerous substances and preparations:

Neither banned nor restricted

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals:

Neither banned nor restricted

REACH-Candidate list of Substances of Very High Concern for Authorisation(Article 59):

This product does not contain substances of very High concern(Regulation(EC) No 1907/2006(REACH), Article 57).

15.2. Chemical safety assessment

For this product, a chemical safety assessment was not carried out.

SECTION 16: Other information

16.1. Full text of H-statements referred to under sections 2 and 3.

| H226 | Flammable liquid and vapour. |
| H314 | Causes severe skin burns and eye damage. |

16.2. Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It, therefore, does not represent any guarantee of the properties of the product. Kumidas shall not be held liable or any damage resulting from handling or from contact with the above product.