1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

- **Product name:** Fludarabine
- **Product Catalogue Number:** 540138
- **Brand:** MedKoo Biosciences
- **CAS-No:** 21679-14-1

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

- **Identified uses:** Laboratory chemicals, Synthesis of substances.

1.3 Details of the supplier of the safety data sheet

- **Company:** MedKoo Biosciences, Inc.
- **Telephone:** 919-636-5577
- **Fax:** 919-980-4831

1.4 Emergency telephone number

For chemical emergency spill, leak, fire, exposure, or accident call CHEMTREC day or night: Within USA and Canada: 1-800-424-9300. Outside USA and Canada: +1 703-527-3887 (collect calls accepted).

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

- **Acute toxicity, Oral (Category 4), H302**

2.2 Label elements

- **Pictogram**

- **Signal word** Warning

- **Hazard statement(s) –**
  - H302 Harmful if swallowed.

- **Precautionary statement(s) –**
  - P264: Wash skin thoroughly after handling.
  - P301 + P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
  - P307 + P311: IF exposed: Call a POISON CENTER or doctor/physician.
  - P330: Rinse mouth.
  - P501: Dispose of contents/container to an approved waste disposal plant.

2.3 Other hazards – no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

- **Synonyms:** Fludarabine; HSDB 6964; HSDB6964; HSDB-6964; NSC 118218; NSC118218; NSC-118218
- **Formula:** C_{10}H_{12}FN_{5}O_{4}
- **Molecular weight:** 285.23
- **CAS-No:** 21679-14-1

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fludarabine</td>
<td>Acute Tox.(O) 4: H302</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

4.1 Description of first aid measures

- **General advice**
  Consult a doctor and show this safety data sheet.

- **If inhaled**
  Remove to fresh air and monitor breathing. If breathing becomes difficult, give oxygen. If breathing stops, give artificial respiration. Consult a doctor.

- **In case of skin contact**
  Immediately wash skin with copious amounts of soap and water for at least 15 minutes. Remove contaminated clothing and shoes and wash before reuse. Consult a doctor.

- **In case of eye contact**
  Flush with copious amounts of water for at least 15 minutes. Consult a doctor.

- **If swallowed**
  Rinse mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by
mouth to an unconscious person. Consult a doctor.

4.2 Most important symptoms and effects, both acute and delayed
To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

4.3 Indication of immediate medical attention and special treatment needed
Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

5. FIRE-FIGHTING 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
In combustion, may emit toxic fumes.

5.3 Precautions for fire-fighters
Wear suitable protective clothing to prevent contact with skin and eyes and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Do not take action without suitable protective clothing - see section 8 of SDS. Evacuate personnel to safe areas. Ensure adequate ventilation. Avoid breathing vapors, mist, dust or gas.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover spillage with suitable absorbent material. Sweep up material and place in an appropriate container. Hold all material for appropriate disposal as described under section 13 of SDS.

6.4 Reference to other sections
For required PPE see section 8. For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Use in a chemical fume hood, with air supplied by an independent system. Avoid inhalation, contact with eyes, skin and clothing. Avoid the formation of dust and aerosols. Use in a well-ventilated area. Keep away from sources of ignition. Avoid prolonged or repeated exposure.

7.2 Conditions for safe storage, including any incompatibilities
Store in cool, well-ventilated area. Keep away from direct sunlight. Keep container tightly sealed until ready for use. Recommended storage temperature: Store at -20°C

7.3 Specific end uses
Use in a laboratory fume hood where possible. Refer to employer's COSHH risk assessment.

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
Use in a fume hood where applicable. Ensure all engineering measures described under section 7 of SDS are in place. Ensure laboratory is equipped with a safety shower and eye wash station.

Personal protective equipment
Eye/face protection
Use appropriate safety glasses.

Skin protection
Use appropriate chemical resistant gloves (minimum requirement use standard BS EN 374:2003). Gloves should be inspected before use. Wash and dry hands thoroughly after handling.

Body protection
Wear appropriate protective clothing.

Respiratory protection
If risk assessment indicates necessary, use a suitable respirator.

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>White to off-white solid powder</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>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
</tbody>
</table>
### pH
No data available

### Solubility(ies)
- ~0.5 mg/ml in a 1:1 solution of DMSO:PBS (pH 7.2)
- ~11 mg/ml in DMSO
- ~3.3 mg/ml in DMF

### Melting / freezing point
No data available

### Boiling point / range
No data available

### Flash point
No data available

### Evaporation rate
No data available

### Flammability (solid, gas)
No data available

### Upper / lower flammability or explosive limits
No data available

### Partition coefficient
No data available

### Auto-ignition temperature
No data available

### Decomposition temperature
No data available

### Viscosity
No data available

### Explosive properties
No data available

### Oxidising properties
No data available

### 9.2 Other safety information
No data available

### 10. STABILITY AND REACTIVITY

#### 10.1 Reactivity
Stable under recommended transport or storage conditions.

#### 10.2 Chemical stability
Stable under recommended storage conditions.

#### 10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions. Decomposition may occur on exposure to conditions or materials listed below.

#### 10.4 Conditions to avoid
Heat, moisture.

#### 10.5 Incompatible materials
Strong oxidizing/reducing agents.

#### 10.6 Hazardous decomposition products
In combustion may emit toxic fumes: carbon dioxide, carbon monoxide, hydrogen fluoride, nitrogen oxides.

### 11. TOXICOLOGICAL INFORMATION

#### 11.1 Information on toxicological effects

- **Acute Toxicological Effects:** Fludarabine - Toxicity Data: Intraperitoneal LD50 (mouse): 375 mg/kg
- **Chronic Toxicological Effects:** Fludarabine - Investigated as a drug and mutagen.

RTECS Number: AU6207000

To the best of our knowledge, the chemical, physical and toxicological properties have not been fully investigated

### 12. ECOLOGICAL INFORMATION

#### 12.1 Toxicity
No data available

#### 12.2 Persistence and degradability
No data available

#### 12.3 Bioaccumulative potential
No data available

#### 12.4 Mobility in soil
No data available

#### 12.5 Results of PBT and vPvB assessment
No data available

#### 12.6 Other adverse effects
No data available

### 13. DISPOSAL CONSIDERATIONS

#### 13.1 Waste treatment methods

- **Product**
  Transfer to a suitable container and arrange for collection by specialized disposal company in accordance with National legislation.

- **Contaminated packaging**
  Dispose of in a regulated landfill site or other method for hazardous or toxic wastes in accordance with National legislation.

### 14. TRANSPORT INFORMATION

Classified according to the criteria of the UN Model Regulations as reflected in the IMDG Code, ADR, RID and IATA.
14.1 UN-Number
Does not meet the criteria for classification as hazardous for transport.

14.2 UN proper shipping name
Does not meet the criteria for classification as hazardous for transport.

14.3 Transport hazard class(es)
Does not meet the criteria for classification as hazardous for transport.

14.4 Packaging group
Does not meet the criteria for classification as hazardous for transport.

14.5 Environmental hazards
This product is not classified as environmentally hazardous according to the UN Model Regulations, nor a marine pollutant according to the IMDG Code.

14.6 Special precautions for users
No data available

15. REGULATORY INFORMATION
This safety datasheet complies with the requirements of Regulation (EC) No. 453/2010.

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
No data available

California Proposition 65
Not applicable

15.2 Chemical safety assessment
A Chemical Safety Assessment has not been made for this product.

16. OTHER INFORMATION

Further Information
Copyright © Medkoo Bioscience. This company shall not be held liable for any damage resulting from handling or from contact with the above product. This material must only be handled by suitably qualified experienced scientists in appropriately equipped and authorized facilities. The above information is believed to be correct but does not purport to be all inclusive and should be used as a guide only for experienced personnel. Always consult your safety advisor and follow appropriate local and national safety legislature. The absence of warning must not, under any circumstance, be taken to mean that no hazard exists. See www.medkoo.com for additional terms and conditions of sale.

Preparation Information
MedKoo Biosciences, Inc.
Product Safety – multiple Region
Tel: 919-636-5577

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