SAFETY DATA SHEET
Gemcitabine

Section 1. Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Code: 11690
Product Name: Gemcitabine
Synonyms: 2'-deoxy-2’,2’-difluoro-cytidine; DDFC; LY 188011; NSC 613327;

1.2 Relevant identified uses of the substance or mixture and uses advised against:
Relevant identified uses: For research use only, not for human or veterinary use.

1.3 Details of the Supplier of the Safety Data Sheet:
Company Name: Cayman Chemical Company
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108
Web site address: www.caymanchem.com
Information: Cayman Chemical Company +1 (734)971-3335

1.4 Emergency telephone number:
Emergency Contact: CHEMTREC Within USA and Canada: +1 (800)424-9300
CHEMTREC Outside USA and Canada: +1 (703)527-3887

Section 2. Hazards Identification

2.1 Classification of the Substance or Mixture:
Acute Toxicity: Oral, Category 4
Acute Toxicity: Skin, Category 4
Skin Corrosion/Irritation, Category 2
Serious Eye Damage/Eye Irritation, Category 2
Germ Cell Mutagenicity, Category 1B
Carcinogenicity, Category 2
Toxic To Reproduction, Category 1B
Specific Target Organ Toxicity (repeated exposure), Category 1
Aquatic Toxicity (Chronic), Category 2

2.2 Label Elements:

GHS Signal Word: Danger

GHS Hazard Phrases:
H302: Harmful if swallowed.
H312: Harmful in contact with skin.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H340: May cause genetic defects.
H351: Suspected of causing cancer.
H360: May damage fertility or the unborn child.
H372: Causes damage to organs (blood, hematopoietic organs, male reproductive organs) through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.
## GHS Precaution Phrases:
- P264: Wash (hands) thoroughly after handling.
- P280: Wear (protective gloves/protective clothing/eye protection/face protection).
- P362+364: Take off contaminated clothing and wash it before reuse.
- P201: Obtain special instructions before use.
- P202: Do not handle until all safety precautions have been read and understood.
- P281: Use personal protective equipment as required.
- P260: Do not breathe (dust/fume/gas/mist/vapours/spray).
- P273: Avoid release to the environment.

## GHS Response Phrases:
- P301+312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P330: Rinse mouth.
- P302+352: IF ON SKIN: Wash with plenty of soap and water.
- P312: Call a (POISON CENTER/doctor/...) if you feel unwell.
- P321: Specific treatment (see ... on this label).
- P332+313: If skin irritation occurs, get medical advice/attention.
- P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P337+313: If eye irritation persists, get medical advice/attention.
- P308+313: IF exposed or concerned: Get medical attention/advice.
- P314: Get medical attention/advice if you feel unwell.
- P391: Collect spillage.

## GHS Storage and Disposal Phrases:
- Please refer to Section 7 for Storage and Section 13 for Disposal information.

### 2.3 Adverse Human Health Effects and Symptoms:
- Causes damage to organs (blood, hematopoietic organs, male reproductive organs) through prolonged or repeated exposure.
- Causes serious eye irritation.
- Causes skin irritation.
- Material may be irritating to the mucous membranes and upper respiratory tract.
- Material may be irritating to the mucous membranes and upper respiratory tract.
- Harmful if swallowed or in contact with skin.
- May be harmful by inhalation.
- May cause genetic defects.
- May cause respiratory system irritation.
- May damage fertility or the unborn child.
- Suspected of causing cancer.
- Toxic to aquatic life with long lasting effects.
- To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

### Section 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>CAS # / RTECS #</th>
<th>Hazardous Components (Chemical Name)/ REACH Registration No.</th>
<th>Concentration</th>
<th>EC No./ EC Index No.</th>
<th>GHS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>95058-81-4</td>
<td>2'-Deoxy-2',2'-difluorocytidine</td>
<td>100.0 %</td>
<td>619-100-6 NA</td>
<td>Acute Tox.(O) 4: H302</td>
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<tr>
<td>HA3835000</td>
<td></td>
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<td>Acute Tox.(D) 4: H312</td>
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<td></td>
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<td>Skin Corr. 2: H315</td>
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<td>Eye Damage 2: H319</td>
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<td></td>
<td></td>
<td>Mutagen 1B: H340</td>
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<td>Carcinogen 2: H351</td>
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<td>Toxic Repro. 1B: H360</td>
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<td>STOT (RE) 1: H372</td>
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<td>Aquatic (C) 2: H411</td>
</tr>
</tbody>
</table>

Multi-region format
Section 4. First Aid Measures

4.1 Description of First Aid Measures:
- **In Case of Inhalation:** Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.
- **In Case of Skin Contact:** Immediately wash skin with soap and plenty of water for at least 15 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.
- **In Case of Eye Contact:** Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Have eyes examined and tested by medical personnel.
- **In Case of Ingestion:** Wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

Section 5. Fire Fighting Measures

5.1 Suitable Extinguishing Media:
- Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.
- Use water spray to cool fire-exposed containers.

5.2 Flammable Properties and Hazards:
- No data available.
- No data available.
- No data.
- LEL: No data. UEL: No data.
- No data.

5.3 Fire Fighting Instructions:
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.

Section 6. Accidental Release Measures

6.1 Protective Precautions, Protective Equipment and Emergency Procedures:
- Avoid raising and breathing dust, and provide adequate ventilation.
- As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).

6.2 Environmental Precautions:
- Take steps to avoid release into the environment, if safe to do so.

6.3 Methods and Material For Containment and Cleaning:
- Contain spill and collect, as appropriate.
- Transfer to a chemical waste container for disposal in accordance with local regulations.

Section 7. Handling and Storage

7.1 Precautions To Be Taken in Handling:
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Avoid prolonged or repeated exposure.

7.2 Precautions To Be Taken in Storing:
- Keep container tightly closed.
- Store in accordance with information listed on the product insert.

Section 8. Exposure Controls/Personal Protection

8.1 Exposure Parameters:
8.2 Exposure Controls:

8.2.1 Engineering Controls: Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. (Ventilation etc.):

8.2.2 Personal protection equipment:

Eye Protection: Safety glasses

Protective Gloves: Compatible chemical-resistant gloves

Other Protective Clothing: Lab coat

Respiratory Equipment: NIOSH approved respirator, as conditions warrant.

(Specify Type):

Work/Hygiene/Maintenance Practices: Do not take internally.

Facilities storing or utilizing this material should be equipped with an eyewash and a safety shower.

Wash thoroughly after handling.

No data available.

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Section 9. Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

Physical States:

[   ] Gas       [   ] Liquid       [ X ] Solid

Appearance and Odor:

A crystalline solid

pH:

No data.

Melting Point:

No data.

Boiling Point:

No data.

Flash Pt:

No data.

Evaporation Rate:

No data.

Flammability (solid, gas):

No data available.

Explosive Limits:

LEL: No data.    UEL: No data.

Vapor Pressure (vs. Air or mm Hg):

No data.

Vapor Density (vs. Air = 1):

No data.

Specific Gravity (Water = 1):

No data.

Solubility in Water:

No data.

Solubility Notes:

~2 mg/ml in PBS (pH 7.2); ~0.25 mg/ml in EtOH; ~5 mg/ml in DMSO; ~0.1 mg/ml in DMF;

Octanol/Water Partition Coefficient:

No data.

Autoignition Pt:

No data.

Decomposition Temperature:

No data.

Viscosity:

No data.

9.2 Other Information

Percent Volatile:

No data.

Molecular Formula & Weight:

C9H11N3O4F2       263.2
Section 10. Stability and Reactivity

10.1 Reactivity: No data available.

10.2 Stability: Unstable [ ] Stable [ X ]

10.3 Stability Note(s): Stable if stored in accordance with information listed on the product insert.

Polymerization: Will occur [ ] Will not occur [ X ]

10.4 Conditions To Avoid: No data available.

10.5 Incompatibility - Materials strong oxidizing agents

To Avoid:

10.6 Hazardous carbon dioxide

Decomposition or carbon monoxide

Byproducts: hydrogen fluoride

nitrogen oxides

Section 11. Toxicological Information

11.1 Information on The toxicological effects of this product have not been thoroughly studied.

Toxicological Effects: Gemcitabine - Toxicity Data: Intraperitoneal TDLO (mouse): 400 mg/kg;

Chronic Toxicological Effects: Gemcitabine - Investigated as a mutagen and tumorigen.

Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.

Gemcitabine RTECS Number: HA3835000

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>NTP</th>
<th>IARC</th>
<th>ACGIH</th>
<th>OSHA</th>
</tr>
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<tbody>
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<td>95058-81-4</td>
<td>2'-Deoxy-2',2'-difluorocytidine</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
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</tbody>
</table>

Section 12. Ecological Information

12.1 Toxicity: Avoid release into the environment.

Runoff from fire control or dilution water may cause pollution.

12.2 Persistence and No data available.

Degradability:

12.3 Bioaccumulative No data available.

Potential:

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.

Section 13. Disposal Considerations

13.1 Waste Disposal Method: Dispose in accordance with local, state, and federal regulations.
Section 14. Transport Information

14.1 LAND TRANSPORT (US DOT):

DOT Proper Shipping Name: Not dangerous goods.
DOT Hazard Class:
UN/NA Number:

14.1 LAND TRANSPORT (European ADR/RID):

ADR/RID Shipping Name: Not dangerous goods.
Hazard Class:
UN Number:

14.3 AIR TRANSPORT (ICAO/IATA):

ICAO/IATA Shipping Name: Not dangerous goods.

Additional Transport Information:
Transport in accordance with local, state, and federal regulations.

Section 15. Regulatory Information

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>S. 302 (EHS)</th>
<th>S. 304 RQ</th>
<th>S. 313 (TRI)</th>
</tr>
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<tbody>
<tr>
<td>95058-81-4</td>
<td>2'-Deoxy-2',2'-difluorocytidine</td>
<td>No</td>
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CAS #  Hazardous Components (Chemical Name) | Other US EPA or State Lists
95058-81-4 2'-Deoxy-2',2'-difluorocytidine | CAA HAP,ODC: No; CWA NPDES: No; TSCA: No; CA PROP.65: No

Regulatory Information
This SDS was prepared in accordance with 29 CFR 1910.1200 and Regulation (EC) No.1272/2008.

Section 16. Other Information

Revision Date: 07/02/2018

Additional Information About This Product:
No data available.

Company Policy or Disclaimer:
DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.