1. Identification

**Chemical Name.** 1,4-Dioxaspiro[4,5]dec-2-ylmethanol

**CAS Number.** 4167-35-5

**Recommendation for the chemical and restrictions on use**

**Applications**
Research and development only. This product is being sent to you as a Research and Development product as defined by the Toxic Substances Control Act (TSCA) of 1976. Due to TSCA's R&D exemption, this product is not listed on the U.S. EPA's Toxic Substances Control Act inventory.

**Restrictions**
This product may not be used for commercial purposes or in formulations used for commercial purposes.

**Supplier's Details**
InKemia Green Chemicals, Inc.
1213 West Loop North Suite 140, Houston, TX 77005
+1 (713) 909-7717
web@inkemiagreenchemicals.com

**Emergency contact number**
InKemia Green Chemicals, Inc.
Tel: +1 (713) 909-7717
For emergency calls only.

2. Hazards

**Classification of the substance or mixture**

**Classification**
Skin irritation (Category 2), H315.
Eye irritation (Category 2A), H319.

**Label elements**

**Pictogram**

![Warning]

**Signal word**
Warning

**Hazard Statements**
H315 - Causes skin irritation.
H319 - Causes serious eye irritation

**Precautionary Statements**
P264 - Wash skin thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
**Other Hazards**

None.

### 3 – Composition/information on ingredients

#### Substances

**Chemical Name.**  
1,4-Dioxaspiro[4,5]dec-2-ylmethanol

**Synonyms.**  
Cyclohexylidene glycerol

**CAS Number.**  
4167-35-5

**Molecular Formula.**  
C₉H₁₆O₃

**Molecular Weight. (g/mol)**  
172.224

#### Hazardous components

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,4-Dioxaspiro[4,5]dec-2-ylmethanol</td>
<td>Skin Irrit. 2, Eye Irrit. 2A; H315, H319.</td>
<td>&lt;=100 wt.%</td>
</tr>
</tbody>
</table>

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

#### Impurities and stabilizing additives

| Aldehydes (as formaldehyde): <500ppm |

#### Mixtures

| Not applicable. |

### 4 – First-aid measures

#### Description of first aid measures

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing Rinse skin with water [or shower].
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention.
P362 - Take off contaminated clothing.
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P235 - Store in a well-ventilated place. Keep cool.
P501 - Dispose of contents/container to an approved waste disposal plant.
General information

Get medical attention if any discomfort continues. Show this Safety Data Sheet to the medical personnel.

Inhalation

Remove from exposure, moving to fresh air. Artificial respiration and oxygen are necessary if not breathing. Consult a physician.

Ingestion

Wash out mouth with water if the person is conscious. Do not induce vomiting. Consult a physician.

Skin contact

Immediately wash skin with soap and copious amounts of water.

Eye contact

Immediately irrigate with copious amounts of water for 15 minutes. Remove contact lenses, if present and easy to do. Consult a physician.

Protection of first-aiders

First aid personnel should wear appropriate protective equipment during any rescue.

Most important symptoms and effects, both acute and delayed

General information

The severity of the symptoms described might vary depending on the concentration and length of exposure.

Inhalation

Slightly dangerous.

Ingestion

Slightly dangerous.

Skin contact

Causes skin irritation.

Eye contact

Causes eye irritation.

Indication of immediate medical attention and special treatment need

Notes for the doctor

Treat symptomatically.

5 - Fire-fighting measure

Extinguishing media

Suitable extinguisher media

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

Unsuitable extinguisher media

No data available.

Special hazards arising from the substance of mixture

Specific hazards

Carbon oxides.

Hazardous combustion products

Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapors.

Advice for firefighters
Protective actions during firefighting
Avoid breathing fire gases or vapors. Evacuate area. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. Avoid discharge to the aquatic environment. Control runoff water by containing and keeping it out of sewers and watercourses. If the risk of water pollution occurs, notify appropriate authorities.

Special protective equipment for firefighting
Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Standard Firefighter's clothing including helmets, protective boots, and gloves provide a basic level of protection for chemical incidents.

6 – Accidental release measures

Personal precautions, protective equipment, and emergency procedures

Personal Precautions
Wear protective clothing as described in Section 8 of this safety data sheet. No action shall be taken without appropriate training or involving any personal risk. Do not touch or walk into the spilled material.

Environmental precautions

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleanup

Methods for cleaning
Contain and remove the spillage, soaking up the residue with non-flammable absorbent. Place in an adequate container for immediate disposal. Eliminate sources of ignition. For waste disposal see Section 13.

Reference to other sections
For personal protection see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For disposal see section 13.

7 – Handling and storage

Precautions for safe handling

Usage precautions
This product is for R+D only. As a TSCA-exempt R&D substance, this product must be used by or directly under the supervision of a technically qualified individual(s) as defined by TSCA. Wear protective clothing as described in Section 8 of this safety data sheet. Keep away from food, drink, and animal feeding stuff. Keep container tightly sealed when not in use. Avoid discharge to the aquatic environment. Do not handle until all safety precautions have been read and understood. Do not handle broken packages without protective equipment. Do not reuse empty containers. For precautions see Section 2.

**Advice on general occupational hygiene**

Promptly wash if in contact with skin. Take off contaminated clothing and wash before reuse. Wash contaminated clothing before reuse.

**Conditions for safe storage, including any Incompatibilities**

**Storage precautions**

Store away from incompatible materials (see Section 10). Keep only in the original container. Keep container tightly closed, in a cool, well-ventilated place. Keep containers upright. Protect containers from damage. Keep in a fresh and dry place, avoiding direct sunlight. Keep container tightly sealed, in a fireproof place.

**Storage class**

Miscellaneous hazardous material storage. Preferably in a well-ventilated solvent cabinet.

**Specific end uses**

The identified uses for this product are in Section 1.

---

**8 – Exposure controls/personal protection**

**Control parameters**

**Occupational exposure limits:**

Contains no substances with occupational exposure limit values.
Protective equipment

Engineering control measures

Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Eye/Face protection

Wear safety glasses with side-shields.

Hand protection

Avoid skin contact. Wear protective clothes and solvent resistant gloves (nitrile).

Other skin and body protection

Use engineering controls to reduce air contamination to permissible exposure level. Wear appropriate clothing to prevent any possibility of liquid contact and repeated or prolonged vapor contact.

Hygiene measures

Wash after use and before eating, smoking and using the toilet. Do not eat, drink or smoke when using this product.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with a multi-purpose combination (US) or type ABEK (EN 14387) 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).

Environmental exposure

Do not let product enter drains.
9 – Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear colorless liquid.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available.</td>
</tr>
<tr>
<td>Melting point/Frozen point, °C</td>
<td>Lower than -50</td>
</tr>
<tr>
<td>Boiling point, °C</td>
<td>248</td>
</tr>
<tr>
<td>Flash point</td>
<td>138</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available.</td>
</tr>
<tr>
<td>Upper / lower flammability or/and explosive limits</td>
<td>No data available.</td>
</tr>
<tr>
<td>Vapor pressure @ 20 °C, kPa</td>
<td>0.0002 (EPI Suite estimation)</td>
</tr>
<tr>
<td>Vapor density (air=1)</td>
<td>No data available.</td>
</tr>
<tr>
<td>Relative density @ 25 °C, g/cm³</td>
<td>1.110</td>
</tr>
<tr>
<td>Water miscibility @ 20 °C, g/L</td>
<td>14 (Moderately miscible)</td>
</tr>
<tr>
<td>Solubility (other)</td>
<td>Miscible with acetone</td>
</tr>
<tr>
<td>Partition coefficient, log Pow @ 25 °C</td>
<td>2.43 (EPI Suite estimation)</td>
</tr>
<tr>
<td>Autoignition temperature, °C</td>
<td>No data available.</td>
</tr>
<tr>
<td>Decomposition temperature, °C</td>
<td>No data available.</td>
</tr>
<tr>
<td>Dynamic viscosity @ 25 °C, cP</td>
<td>150.7</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not classified.</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available.</td>
</tr>
<tr>
<td>Flammability</td>
<td>Non-flammable liquid.</td>
</tr>
<tr>
<td>Surface tension @ 20 °C, mN/m</td>
<td>41.3</td>
</tr>
</tbody>
</table>

10 – Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>No data available.</td>
</tr>
<tr>
<td>Chemical stability</td>
<td>Stable under normal storage conditions.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>Hazardous polymerization do not occur under normal conditions.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>Heat and ignition sources.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Carbon oxides.</td>
</tr>
</tbody>
</table>

11 – Toxicological information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity – oral</td>
<td>&gt;2,000</td>
</tr>
<tr>
<td>Acute toxicity – oral (LD50,mg/kg)</td>
<td>Rat</td>
</tr>
<tr>
<td>Species</td>
<td></td>
</tr>
<tr>
<td>Notes (oral LD50)</td>
<td>Based on available data the classification criteria are not met.</td>
</tr>
</tbody>
</table>

Acute toxicity - dermal
Acute toxicity – dermal (LD50, mg/kg)  No data available.

Notes (Dermal LD50)  Based on available data the classification criteria are not met.

Acute toxicity – inhalation  No data available.

Acute toxicity – inhalation (LC50, dust/mist mg/l)  No data available.

Notes (Inhalation LD50)  Based on available data the classification criteria are not met.

Skin corrosion/irritation  Result  Irritatant to skin.

Serious eye damage/irritation  Result  Irritatant to eyes.

Respiratory sensitization  Result  Based on available data the classification criteria are not met.

Skin sensitization  Result  Based on available data the classification criteria are not met.

Germ cell mutagenicity  Based on available data the classification criteria are not met.

Genotoxicity – in vitro  Based on available data the classification criteria are not met.

Genotoxicity – in vivo  Based on available data the classification criteria are not met.

Carcinogenicity

IARC  No component of this product present at levels greater than or equal to 0.1% is identified as human carcinogen by IARC.

ACGIH  No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP  No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA  No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

Fertility  Based on available data the classification criteria are not met.

Development  Based on available data the classification criteria are not met.

Specific target organ toxicity

STOT-single exposure  No data available.

STOT-repeated exposure  No data available.

Additional information
### General information

This product is classified as an eye irritant.

### Inhalation

No data available.

### Ingestion

No data available.

### Skin contact

No data available.

### Eye contact

Eye irritant.

### Route of entry

Ingestion, Inhalation, skin and/or eye contact.

### Target organs

Not specific target organ known.

### 12 - Ecological information

#### Toxicity

**Ecotoxicity**

Not regarded as dangerous for the environment. However, large or frequent spills may have dangerous effects on the environment.

**Acute toxicity**

- **Toxicity to fish**
  
  LC50 (96h.) = 843 mg/l (Fathead minnow; EPA-T.E.S.T Estimation)

- **Aquatic invertebrates**
  
  EC50 (48h.) = 212 mg/l (Daphnia magna; EPA-T.E.S.T Estimation)

- **Aquatic plants**
  
  IGC50 (48h.) = 1,485 mg/l (T. pyroformis ; EPA-T.E.S.T Estimation)

#### Persistency and biodegradability

**Persistency and biodegradability**

No data available.

**Result:** -

This product is readily biodegradable. (EPI Suite Estimation)

**Biodegradation**

This product will not persist and/or bioaccumulate in the aquatic environment (LogPow=1.1 and BCF<500).

**Biological oxygen demand(mg/g)**

No data available.

**Chemical oxygen demand(mg/g)**

No data available.

**BOD/COD ratio**

No data available.

**Bioaccumulative potential**

No data available.

**Mobility in soil**

No data available.
Results of PBT and vPvB
No data available.

Other adverse effects
No data available.

13 – Disposal considerations

Waste treatment methods

General information
The generation of waste should be minimized or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of safely. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. When handling waste, the safety precautions applying to the handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Empty containers or liners may retain some product residues.

Disposal methods
Do not empty into drains. Dispose of surplus products and those that cannot be recycled via a licensed waste disposal contractor. Waste, residues, empty containers, discarded work clothes and contaminated cleaning materials should be collected in designated containers, labeled with their contents. Incineration and landfill should only be considered when recycling is not feasible.

14 – Transport information

DOT (US)
Not classified as hazardous goods.

IMDG
Not classified as hazardous goods.

IATA
Not classified as hazardous goods.

Transport in bulk according to
Annex II of MARPOL 73/78, and the IBC Code:
Not applicable.

15 – Regulatory information

US Federal Regulations and state regulations
Components of the product are listed in the quoted regulations. For details, please refer to the regulations directly. This list is not exhaustive; please check for other applicable regulations.

This product has been classified by hazard criteria of the Controlled Products Regulations, and the SDS contains all the information required by the Controlled Products Regulations.

US Federal Regulations

SARA 302 Section 302 (Specific toxic chemical listings)
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA Section 311/312 (Specific toxic chemical listings)
Acute Health Hazard.

SARA Section 313 (Specific toxic chemical listings)
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**RCRA (hazardous waste code)**
None of the ingredients are listed.

**TSCA (Toxic Substances Control Act)**
CAS: 4167-35-5 is not listed on the TSCA inventory. This product is for R+D use only.

**CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)**
None of the ingredients are listed.

**US State Regulations**

**Proposition 65 (California)**
Chemicals are known to cause cancer
None of the chemicals in this product are listed.

Chemicals are known to cause reproductive toxicity for females
None of the chemicals in this product are listed.

Chemicals are known to cause reproductive toxicity for males
None of the chemicals in this product are listed.

**Massachusetts Right to Know Components**
No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right to Know Components**
No components are subject to the Pennsylvania Right to Know Act.

**New Jersey Right to Know Components**
No components are subject to the New Jersey Right to Know Act.

**Canada**

**Canadian Domestic Substances List (DSL)**
CAS: 4167-35-5 is not listed on the Canada's DSL List. This product is for R+D use only.

**Canadian NPRI Ingredient Disclosure list (limit 0.1%)**
The substance is not specified on any list. There is no control measure imposed to this substance.

**Canadian NPRI Ingredient Disclosure list (limit 1%)**
The substance is not specified on any list. There is no control measure imposed to this substance.

**16 – Other information**

**Full text of H-Statements referred to under sections 2 and 3**
Eye Irrit. Eye irritation
Skin Irrit. Skin irritation.
H319 Causes serious eye irritation.
H315 Causes skin irritation.

**GHS Column Model 2017 Classification**

<table>
<thead>
<tr>
<th>Health hazards</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute health hazards (single exp)</td>
<td>Low</td>
</tr>
<tr>
<td>Chronic health hazards (repeated exp.)</td>
<td>Negligible</td>
</tr>
</tbody>
</table>
Further Information
The information above is believed to be accurate and represents the best information available. However, we make no warranty of merchantability or any other warranty, express or implied, on such information and we assume no liability resulting from its use. Users should make their investigations to determine the suitability of the information for their purposes. In no event shall the InKemia Green Chemicals, Inc. be liable for any claims, losses or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages arising, even if the InKemia Green Chemicals, Inc. has been advised of the possibility of such damages.

Environmental hazards
Negligible

Physical-chemical hazards
Negligible

Issued by LHD
Ver. 2.0 Rev. 21-01-2019
Print.