1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers
Product name: 1H,1H,9H,9H-PERFLUORO-1,9-NONANEDIOL
Synonyms: 2,2,3,3,4,4,5,5,6,6,7,7,8,8-Tridecafluoro-1,9-nonanediol
Product number: C9DIOL
CAS-No.: 203303-01-9

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses: For R&D use only.

1.3 Details of the supplier of the safety data sheet
Company: Exfluor Research Corporation
2350 Double Creek Drive
ROUND ROCK, TEXAS 78664
USA
Telephone: +1 512-310-9044

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

<table>
<thead>
<tr>
<th>GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)</th>
<th>H315</th>
<th>H319</th>
<th>H335</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin irritation (Category 2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye irritation (Category 2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific target organ toxicity – single exposure Respiratory system (Category 3A)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

2.2 GHS Label Elements, including precautionary statements

Pictogram
Signal word Warning

Hazard statement(s)
- H315 Causes skin irritation.
- H319 Causes serious eye irritation.
- H335 May cause respiratory irritation.

Precautionary statement(s)
- P264 Wash hands thoroughly after handling.
- P302 + P350 IF ON SKIN: Gently wash with soap and water.
- P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do—continue rinsing.
- P332 + P313 If skin irritation occurs: Get medical advice/attention.
- P337 + P313 If eye irritation persists: Get medical advice/attention.
2.3 Hazards not otherwise classified (HNOC) or not covered by GHS
none

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances
Formula: C_{9}H_{6}F_{14}O_{2}
Molecular Weight: 412 g/mol

Component:
CAS-No.: 203303-01-9
Concentration: 90%

4. FIRST AID MEASURES

4.1 Description of first-aid measures

General advice
Move out of dangerous area. Consult a physician. Show this safety sheet to the doctor in attendance.

If inhaled
Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

In case of skin contact
Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

In case of eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Ensure adequate flushing of the eyes by separating the eyelids with fingers.

If swallowed
Do not induce vomiting. Never give anything by mouth to an unconscious person. Allow victim to rinse his mouth with water. Allow victim to drink 2 – 4 cupfuls of water. Call Poison Control center.

4.2 Most important symptoms and effects, both acute and delayed
See § 2.2 and § 11.

4.3 Indication of any immediate medical attention and special treatment needed
Note to physician: Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media
Water spray, carbon dioxide, dry chemical powder, or polymer foam.

5.2 Special hazards arising from the substance or mixture
Releases toxic fumes of carbon oxides and hydrogen fluoride.

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency measures
Use personal protective equipment. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Restrict access to area until completion of clean-up.
6.2 **Environmental precautions**
Prevent further leakage or spillage if safe to do so. Do not allow material to enter drains. If necessary, dike ahead of spill to prevent runoff into drains, sewers, or any natural waterway or drinking supply.

*If applicable*: If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the national response center in the US at 1-800-424-8802.

6.3 **Methods and materials for containment and cleaning up**
Soak up the spill with an inert absorbent material. Contaminated absorbent material may pose the same hazards as the spilled product. Place in container for disposal according to local regulations.

6.4 **Reference to other sections**
Refer to protective measures listed in § 7 and § 8.

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### 7. HANDLING AND STORAGE

7.1 **Precautions for safe handling**
For precautions, see § 2.2.
Do not handle until all safety precautions have been read and understood. Wear protective gloves and eye/face protection. Use only in well-ventilated areas. Avoid inhalation of vapor or mist. Avoid contact with skin, eyes, and clothing. Keep away from heat and open flames. Do not eat, drink, or smoke when using this product. Wash hands thoroughly after handling.

7.2 **Conditions for safe storage, including any incompatibilities**
Keep container tightly closed. Store in cool, dry, and well-ventilated place. Empty containers retain residue (powder and/or vapor) and can be dangerous. Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances (see § 10.5).

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

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### 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 only in well-ventilated areas. Provide local exhaust or a process enclosure ventilation system. Avoid contact with skin, eyes and clothing.

**Personal protective equipment**

**Eye/face protection**
Wear safety glasses or chemical safety goggles and face shield. Provide an emergency eye wash station and quick drench shower in the immediate work area.

**Skin protection**
Handle with appropriate chemical-resistant 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.

**Body protection**
The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Respiratory protection not required.

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

General hygiene considerations
Do not breathe vapors. Avoid contact with skin, eyes, and clothing. Do not eat, drink, or smoke when using this product. Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing before re-use. Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties
a) Appearance                          white powder
b) Odor                                no data available
c) Odor threshold                      no data available
d) pH                                   no data available
e) Melting/freezing point              108-112°C (226-234 °F)
f) Initial boiling point/range          140 °C (284 °F) at 5 mmHg
g) Flash point                          no data available
h) Evaporation rate                    no data available
i) Flammability (solid, gas)           no data available
j) Upper/lower flammability            no data available or explosive limits
k) Vapor pressure                      no data available
l) Vapor density                       no data available
m) Relative density                    no data available
n) Solubility                          soluble in water
o) Partition coefficient: n-octanol/water no data available
p) Auto-ignition temperature           no data available
q) Decomposition temperature          no data available
r) Viscosity                           no data available
s) Explosive properties                no data available
t) Oxidizing properties                no data available

9.2 Other safety information
none

10. STABILITY AND REACTIVITY

10.1 Reactivity
No unusual reactivity. See § 10.5.

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reaction
No data available

10.4 Conditions to avoid
Extreme heat

10.5 Incompatible materials
Strong oxidizing agents
10.6 Hazardous decomposition products
Hazardous polymerization does not occur.
Releases toxic fumes of carbon oxides and hydrogen fluoride.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
Acute toxicity
No data available

Skin corrosion/ irritation
No data available

Serious eye damage/ irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
IARC: 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.

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
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

11.2 Additional information
To the best of our knowledge, the acute and chronic toxicity of this substance is not fully known.

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
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Refer to protective measures listed in § 7 and § 8.
Dispose of in accordance with all applicable federal, state, and local regulations.
Place in a chemical secured landfill or incinerate at 1200°C with a 2 second dwell time or at 1600°C with a 1.5 second dwell time. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Empty containers retain residue and can be dangerous. Disposal must be made according to official regulations.

14. TRANSPORTATION INFORMATION

DOT (US) / IMDG / IATA
Not classified as hazardous for transport

15. REGULATORY INFORMATION

US federal information
Not on TSCA Inventory. For R&D use only.

16. OTHER 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. Exfluor Research Corporation shall not be held liable for any damage resulting from handling or from contact with the above product.