MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY

Product Name: Peptide Nucleic Acid (PNA)
Catalog Number: PN-CNxxx-xxx ; PN-CPxxx-xxx ; PN-TCxxx-xxx ; PN-TGxxx-xxx
Purpose: Research Use Only
Supplier: PANAGENE Inc.
54, Techno 10-ro, Yuseong-gu, Daejeon, 34027, Korea
Tel: +82-42-861-9296

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Component</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peptide Nucleic Acid (PNA)</td>
<td>Hazardous components &lt; 1%</td>
<td>None</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Prolonged or repeated contact with this product may cause slight irritation on the skin, eyes, gastrointestinal and respiratory systems.

4. FIRST AID MEASURES

**Inhalation**
Move to uncontaminated area. If not breathing, give artificial respiration. Get medical attention immediately.

**Skin contact**
Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

**Eye contact**
Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**Ingestion**
If swallowed, wash out mouth with water and get medical attention.

5. FIRE-FIGHTING MEASURES

**Fire and explosion hazards**
N/A.

**Extinguishing media**
CO2, extinguishing powder or water spray.

**Fire fighting**
Move the container from the fire area if it can be done without risk. Avoid inhalation of the gas of the combustion of the material or the by-products. Stay upwind of the fumes and keep out of the low areas.

**Hazardous combustion products**
Thermal decomposition products or combustion: oxides of carbon, oxides of sulfur

6. ACCIDENTAL RELEASE MEASURES

Sweep up the material and place in a closed bag or a container for disposal. Avoid raising dust. Ventilate the area and wash spill site after material pickup is completed.
7. HANDLING AND STORAGE

**Storage**
Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

**Handling**
User Exposure: Avoid inhalation. Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering control**
Mechanical exhaust required. Safety shower and eye bath.

**General hygiene measures**
Wash thoroughly after handling.

**Exposure limits**
No occupational exposure limits established.

**Personal protective equipments**
- Eyes: Wear chemical safety goggles.
- Hands: Wear compatible chemical-resistant gloves.
- Respiratory: Wear government approved respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL STATE:** Solid (Powder)

**ODOR:** None

**BOILING POINT:** N/A

**MELTING POINT:** N/A

**VAPOR PRESSURE:** N/A

**VAPOR DENSITY:** N/A

**SPECIFIC GRAVITY:** N/A

**WATER SOLUBILITY:** N/A

**PH:** N/A

**VOLATILITY:** N/A

**ODOR THRESHOLD:** N/A

**EVAPORATION RATE:** N/A

**COEFFICIENT OF WATER/OIL DISTRIBUTION:** N/A

10. STABILITY AND REACTIVITY

**Reactivity**
Stable at normal temperature and pressure.

**Conditions to avoid**
Avoid heat.

**Incompatibilities**
Strong acids, strong oxidizing materials.

**Hazardous decomposition**
Will not occur.

**Polymerization**
Will not occur.

11. TOXICOLOGICAL INFORMATION

**Health effects**
ADDITIONAL DATA: The toxicological properties have not been fully investigated.

**Inhalation**
ACUTE EXPOSURE: May cause irritation. CHRONIC EXPOSURE: No data available.

**Skin contact**
ACUTE EXPOSURE: May cause irritation. CHRONIC EXPOSURE: No data available.

**Eye contact**
ACUTE EXPOSURE: May cause irritation. CHRONIC EXPOSURE: No data available.

**Ingestion**
ACUTE EXPOSURE: May cause irritation CHRONIC EXPOSURE: No data available.

12. ECOLOGICAL INFORMATION

N/A
13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

US Department of transportation: No classification assigned.
LAND TRANSPORT ADR: No classification assigned.
LAND TRANSPORT RID: No classification assigned.
AIR TRANSPORT IATA: No classification assigned.
AIR TRANSPORT ICAO: No classification assigned.
MARITIME TRANSPORT IMDG: No classification assigned.

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.
ACUTE: No
CHRONIC: No
FIRE: No
REACTIVE: No
SUDDEN RELEASE: No
NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Not listed on inventory. For purposes of 40 CFR 720.36, this product is for Research and Development (R&D) Use Only.
TSCA 12(b) EXPORT NOTIFICATION: Not listed.

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.