SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Identification

Product Name
X-CLARITY™ Polymerization initiator

Product Number
C13104

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

Identified uses:
Laboratory chemicals, Manufacture of substances

Manufacturer
Logos Biosystems, Inc.
FL 2 & 3 28 Simindaero 327 beon-gil
Dongan-gu, Anyang-si
Gyeonggi-do 14055
South Korea
Telephone: +82-31-478-4185
Fax: +82-31-360-4277
E-mail: sales@logosbio.com

Supplier
Logos Biosystems, Inc.
FL 2 & 3 28 Simindaero 327 beon-gil
Dongan-gu, Anyang-si
Gyeonggi-do 14055
South Korea
Telephone: +82-31-478-4185
Fax: +82-31-360-4277
E-mail: sales@logosbio.com

Emergency telephone number
+82 31 478 4185

For research use only. Not intended for human or animal diagnostic or therapeutic use.

2. HAZARDS IDENTIFICATION

[GHS classification]

Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008
Acute Tox. 4 H302
Skin Irrit. 2 H315
Skin Sens. 1 H317
Eye Irrit. 2 H319
Acute Tox. 4 H332
STOT SE 3a H335

Label elements
Labelling according Regulation (EC) No 1272/2008
Signal word  Warning

Hazard statements
  H302 + H332 – Harmful if swallowed or inhaled.
  H315 – Causes skin irritation.
  H317 – May cause an allergic skin reaction.
  H319 – Causes serious eye irritation.
  H335 – May cause respiratory irritation.

Precautionary statements
  P261 – Avoid breathing dust/fume/gas/mist/vapors/spray.
  P264 – Wash skin thoroughly after handling.
  P270 – Do not eat, drink, or smoke when using this product.
  P271 – Use only outdoors or in a well-ventilated area.
  P272 – Contaminated work clothing should not be allowed out of the workplace.
  P280 – Wear protective gloves, eyewear, and clothing.
  P301 + P312 + P330 – IF SWALLOWED: Rinse mouth. Call a POISON CENTER or doctor/physician if you feel unwell.
  P302 + P352 – IF ON SKIN: Wash with plenty of soap and water.
  P304 + P312 + P340 – IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician immediately if you feel unwell.
  P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.
  P332 + P313 – If skin irritation or rash occurs: Get medical advice/attention.
  P337 + P313 – If eye irritation persists: Get medical advice/attention.
  P362 + P364 – Take off contaminated clothing and wash before reuse.
  P403 + P233 – Store in a well-ventilated place. Keep container tightly closed.
  P405 – Store locked up.
  P501 – Dispose of contents/container to an approved waste disposal plant.

Other hazards
None

3. COMPOSITION / INFORMATION ON INGREDIENTS

Mixtures

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>Formula</th>
<th>CAS No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,2’-Azobis[2-(2-imidazolin-2-yl)propane]dihydrochloride</td>
<td>C_{12}H_{22}N_{6}O·2HCl</td>
<td>27776-21-2</td>
<td>100%</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Description of first aid measures

<p>| In case of eye contact | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required. |</p>
<table>
<thead>
<tr>
<th>In case of skin contact</th>
<th>Wash off immediately with plenty of water for at least 15 minutes. Remove and wash contaminated clothing before re-use.</th>
</tr>
</thead>
<tbody>
<tr>
<td>After inhalation</td>
<td>Move to fresh air. If not breathing, give artificial respiration. Call a physician or Poison Control Centre immediately</td>
</tr>
<tr>
<td>After swallowing</td>
<td>Do not induce vomiting without medical help</td>
</tr>
<tr>
<td>Indication of any immediate medical attention and special treatment needed</td>
<td>No further relevant information available</td>
</tr>
</tbody>
</table>

### 5. FIRE-FIGHTING MEASURES

**Extinguishing media**

**Suitable extinguishing media**
Use CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

**Special hazards arising from the substances or mixture**
Carbon oxides, nitrogen oxide

**Advice of fire-fighters**

**Protective equipment**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**Further information**
No further relevant information available

### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures**
Avoid contact with skin, eyes and clothing. Use personal protective equipment

**Environmental precautions**
Do not allow to enter sewers/ surface or ground water.

**Methods and materials for containment and cleaning up**
Take up mechanically and collect in suitable container for disposal.

**Reference to other sections**
No further relevant information available

### 7. HANDLING AND STORAGE

**Precautions for safe handling**
Always wear recommended Personal Protective Equipment (mask, glove).

**Conditions for safe storage, including any incompatibilities**
Keep away from sources of ignition, high temperature.
Specific end use(s)
No further relevant information available

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters
Components with workplace control parameters

Exposure controls

Appropriate engineering controls
Avoid contact eyes, skin. Wash hands immediately after handling

Personal protective equipment

<table>
<thead>
<tr>
<th>Respiratory protection</th>
<th>Hood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand protection</td>
<td>Protective gloves</td>
</tr>
<tr>
<td>Eye protection</td>
<td>Safety glasses</td>
</tr>
<tr>
<td>Skin and Body protection</td>
<td>Handle with Protective gloves and wear lab clothing</td>
</tr>
<tr>
<td>Control of Environmental exposure</td>
<td>Hood</td>
</tr>
</tbody>
</table>

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Form: powder</td>
</tr>
<tr>
<td>Odour</td>
<td>No data available</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>[5.5 - 6.5]</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>188 -193°C</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapour density</td>
<td>No data available</td>
</tr>
</tbody>
</table>
### Specific Gravity/Relative density
No data available

### Solubility
Water soluble

### Partition coefficient: n-octanol / water
No data available

### Auto-ignition temperature
No data available

### Decomposition temperature
No data available

### Viscosity
No data available

### Dynamic viscosity
No data available

**Other safety information**
No further relevant information available

---

#### 10. STABILITY AND REACTIVITY

**Stability**

<table>
<thead>
<tr>
<th>Stability</th>
<th>Hygroscopic, Thermally unstable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>No data available</td>
</tr>
</tbody>
</table>

**Possibility of hazardous reactions**
No further relevant information available

**Conditions to avoid**
Moisture, direct sunlight, high temperature

**Incompatible materials**
Strong oxidizing agents

**Hazardous decomposition products**
Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide

---

#### 11. TOXICOLOGICAL INFORMATION

**Acute toxicity**
2,2'-Azobis[2-(2-imidazolin-2-yl)propane]dihydrochloride (27776-21-1) : Oral LD50 2.8 g/kg (Rat)

**Skin corrosion/irritation**
Irritant to skin and mucous membranes

**Serious eye damage/eye irritation**
No further relevant information available

**Respiratory or skin sensitization**
Sensitization was accepted by human.

**Germ cell mutagenicity**
No further relevant information available

**Carcinogenicity**
No further relevant information available
Reproductive toxicity
No further relevant information available

Specific target organ toxicity – single exposure
No further relevant information available

Specific target organ toxicity – repeated exposure
No further relevant information available

Aspiration hazard
No further relevant information available

Potential health effects
No further relevant information available

Additional Information
No further relevant information available

12. ECOLOGICAL INFORMATION

Toxicity
No further relevant information available

Persistence and degradability
No further relevant information available

Bioaccumulative potential
No further relevant information available

Mobility in soil
No further relevant information available

Results of PBT and vPvB assessment
No data available

Other adverse effects
No further relevant information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Product
Hand over to hazardous waste disposer

Contaminated packaging
 Accord to official regulations

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods
IMDG
15. REGULATORY INFORMATION

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

Safety, health and environmental regulations/legislation specific for the substance or mixture
No further relevant information available

Chemical safety assessment
A chemical safety assessment has not been carried out

16. OTHER INFORMATION

Further information
Copyright 2016. Logos Biosystems, Inc. License granted to make unlimited paper copies for internal use only.

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Logos Biosystems, Inc. and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See the reverse side of invoice or packing slip for additional terms and conditions of sale.

End of Safety Data Sheet