SAFETY DATA SHEET
SAPPHIRE OPTICAL CRYSTAL
According to Regulation (EC) No.1907/2006 (REACH)

Revision 2016 : Issued 5th May 2016

1. IDENTIFICATION OF THE SUBSTANCE AND THE COMPANY

1.1. PRODUCT IDENTIFIERS:
Product Name: Sapphire Optical Crystal
Synonyms, Trade Names: Al₂O₃; Aluminium Oxide; Alumina; Corundum

1.2. RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST
Identified Uses: Optical Material for manufacture of Optical Components.

1.3. DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET
Company: CRYSTRAN LTD, 1 Broom Road Business Park, Poole, Dorset UK BH12 4PA
Emergency Phone: +44 1202 307650 (Monday to Friday 08:30 to 17:00 GMT)

1.4. EMERGENCY TELEPHONE NUMBER
Emergency Action: In the event of a medical enquiry involving this product, please contact your doctor or local hospital accident and emergency department. The attending health professional will be able to contact the National Poisons Information Service.

2. HAZARDS IDENTIFICATION

2.1. CLASSIFICATION OF THE SUBSTANCE OR MIXTURE
Not classified as dangerous according to EC directives.

2.2. LABEL ELEMENTS
None

2.3. OTHER HAZARDS
None

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. SUBSTANCES

<table>
<thead>
<tr>
<th>Component Name</th>
<th>CAS number</th>
<th>%</th>
<th>EC number (EINECS)</th>
<th>EU index</th>
<th>UN number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sapphire</td>
<td>1344-28-1</td>
<td>100%</td>
<td>215-691-6</td>
<td>-</td>
<td>None</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

4.1. DESCRIPTION OF FIRST AID MEASURES
GENERAL: Consult a doctor for specific advice.
EYES: Irrigate thoroughly with water for at least 15 minutes. Obtain medical attention.
SKIN: Wash thoroughly with soap and water.
INHALATION: Remove to fresh air.
INGESTION: Wash out mouth thoroughly with water and give 2 cups of water to drink.

4.2. INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED
No Data.

5. FIRE FIGHTING MEASURES

5.1. EXTINGUISHING MEDIA
This product does not burn.

5.2. SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE
None

5.3. ADVICE FOR FIREFIGHTERS
None

6. ACCIDENTAL RELEASE MEASURES

6.1. PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES
 Wear suitable protective clothing & equipment as listed under Section 8. Avoid making dust.

6.2. ENVIRONMENTAL PRECAUTIONS
None

6.3. METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP
Take up and containerize for proper disposal to avoid sharp edges.

6.4. REFERENCE TO OTHER SECTIONS
Dispose as in Section 13.

7. HANDLING AND STORAGE

7.1. PRECAUTIONS FOR SAFE HANDLING:
None

7.2. CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES
No special conditions

7.3. SPECIFIC END USES
Optical Material for Manufacture of Optical Components.

CRYSTRAN LTD
1, Broom Road Business Park, Poole, Dorset, UK BH12 4PA TEL: +44 1202 307650 FAX +44 1202 307651
Email: sales@crystran.co.uk www.crystran.co.uk Registered in England No.2863378

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8. EXPOSURE CONTROL AND PERSONAL PROTECTION

8.1. CONTROL PARAMETERS

OCCUPATIONAL EXPOSURE LIMITS (OEL) (As Dust) = 10 mg/m³ in 8 hour Time Weighted Average (TWA)

8.2. EXPOSURE CONTROLS

Protective gloves made of PVA are required. Use of a laboratory coat is suggested. Safety goggles or safety glasses with side shields are required if there is any possibility of chipping or dust creation. Respirators must be worn when the threshold limit is exceeded. Provide adequate general mechanical ventilation, and local exhaust ventilation. Wash hands immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear glassy geometric shapes, no odour.
BOILING POINT (760mm Hg): 2977°C
MELTING POINT: 2053°C
SPECIFIC GRAVITY: 3.97 g/mL
SOLUBILITY IN WATER: Practically Insoluble

9.2. OTHER SAFETY INFORMATION

None

10. STABILITY AND REACTIVITY

10.1. REACTIVITY

Stable

10.2. CHEMICAL STABILITY

Stable under normal conditions of storage and use.

10.3. POSSIBILITY OF HAZARDOUS REACTIONS

None known

10.4. CONDITIONS TO AVOID

None known

10.5. INCOMPATIBLE MATERIALS

None

10.6. HAZARDOUS DECOMPOSITION PRODUCTS

None

11. TOXICOLOGICAL INFORMATION

11.1. INFORMATION ON TOXICOLOGICAL EFFECTS

TOXIC DOSE - LD50: No Data
CARCINOGENICITY: No evidence of carcinogenic properties.
MUTAGENICITY/TERATOGENICITY: No evidence of reproductive effects.

12. ECOLOGICAL INFORMATION

12.1. TOXICITY

Not toxic

12.2. PERSISTENCE AND DEGRADABILITY

No Data

12.3. BIOACCUMULATIVE POTENTIAL

No Data

12.4. MOBILITY IN SOIL

No Data

12.5. RESULTS OF PBT AND vPvB ASSESSMENT

Not required or conducted

12.6. OTHER ADVERSE AFFECTS

No Data.

13. DISPOSAL CONSIDERATIONS

13.1. WASTE TREATMENT METHODS

Chemical residues are generally classified as special waste, and are covered by regulations which vary according to location. Normally we would expect sapphire waste to be disposed of as glass or dust. Contact your local waste disposal authority for advice, or pass to a chemical disposal company.

14. TRANSPORT INFORMATION

14.1. UN NUMBER: None

14.2. UN PROPER SHIPPING NAME: Non Hazardous Material

14.3. TRANSPORT HAZARD CLASS: None

14.4. PACKING GROUP: N/A

14.5. ENVIRONMENTAL HAZARDS: None

14.6. SPECIAL PRECAUTIONS FOR USER: None

14.7. TRANSPORT IN BULK MARPOL / IBC: No Data

15. REGULATORY INFORMATION

15.1. SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS / LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE

TSCA: Listed in the TSCA inventory
SARA: 302/304: Not Listed

16. OTHER INFORMATION

REVISION DATE: 5th May 2015 ©2016 Cytrsan Ltd.
The above information is believed to be correct but does not purport to be all inclusive and must be used only as a guide.