MATERIAL SAFETY DATA SHEET
OSHA HAZARD COMMUNICATION RULE

DATE OF LAST REVISION: 05-08-96

CHEMICAL IDENTITY

<table>
<thead>
<tr>
<th>LABEL IDENTITY</th>
<th>CHEMICAL NAME/SYNONYMS</th>
<th>FORMULA</th>
<th>CHEMICAL FAMILY</th>
<th>CAS REGISTRY NUMBER</th>
<th>HAZARDOUS INGREDIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LANTHANUM ALUMINATE</td>
<td>LANTHANUM ALUMINATE</td>
<td>LaAlO₃</td>
<td>NA</td>
<td>NA</td>
<td>ALUMINUM OXIDE COMPOUNDS</td>
</tr>
<tr>
<td></td>
<td>%: 100</td>
<td>TLV: 10mg/m³</td>
<td>OSHA/PEL: 10mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>COLOR, FORM AND ODOR</th>
<th>BOILING POINT</th>
<th>DENSITY (gm/cc)</th>
<th>VAPOR PRESSURE @ 20°</th>
<th>% VOLATILE BY VOLUME (%)</th>
<th>REACTION WITH WATER</th>
<th>EVAPORATION RATE (H₂O=1)</th>
<th>SOLUBILITY IN WATER</th>
<th>MELTING POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ND</td>
<td>Not known</td>
<td>Not known</td>
<td>No information</td>
<td>None</td>
<td>No information</td>
<td>None</td>
<td>Mineral acids</td>
<td>None</td>
</tr>
</tbody>
</table>

FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>AUTOIGNITION TEMPERATURE (°C)</th>
<th>FLAMMABILITY</th>
<th>EXTINGUISHING MEDIA</th>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
<th>UNUSUAL FIRE &amp; EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>NA</td>
<td>NA</td>
<td>Use suitable means for extinguishing surrounding fire</td>
<td>Wear a self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes.</td>
<td>None</td>
</tr>
</tbody>
</table>
LANTHANUM ALUMINATE
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HEALTH HAZARD INFORMATION

TOXICITY DATA:  R & D material, limits not established, treat as Al2O3:  10mg/m3
HMIS RATING:
HEALTH: na FLAMMABILITY: na REACTIVITY: na PERSONAL PROTECTION: na

ROUTES OF ENTRY
INHALATION: Yes
SKIN: Yes
INGESTION: Yes

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:  No data
EFFECTS OF OVEREXPOSURE (acute and chronic):  R & D material, effects not established

CARCINOGENICITY: Na NTP: Na IARC MONOGRAPHS: Na OSHA REGULATE: Na

EMERGENCY FIRST AID PROCEDURES:
INGESTION: seek medical attention.
INHALATION: remove victim to fresh air
SKIN CONTACT: wash affected area with soap and water
EYE CONTACT: seek medical attention.
*seek medical attention in all cases mentioned above*

REACTIVITY DATA

STABILITY: Stable
CONDITIONS CONTRIBUTING TO UNSTABILITY: Not known
CONDITIONS TO AVOID: None
INCOMPATIBILITY (MATERIALS TO AVOID): Not known
HAZARDOUS DECOMPOSITION PRODUCTS: None
HAZARDOUS POLYMERIZATION: Will Not Occur
CONDITIONS TO AVOID: None known
LANTHANUM ALUMINATE
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SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Pick up and place in suitable container for reclamation or disposal in a method
that does not generate dust.

WASTE DISPOSAL METHOD:
Consult federal, state and local regulations for proper disposal.

SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION
NIOSH approved, consult supplier for all
limitations
LOCAL EXHAUST
Preferred
MECHANICAL (general)
NA
SPECIAL
NA
OTHER
NA
PROTECTIVE GLOVES
Recommended
EYE PROTECTION
Always recommended
OTHER PROTECTIVE EQUIPMENT
Lab coat or apron

SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE:
Keep in tightly closed container, store in a cool, dry ventilated area, isolate from
incompatible substances.

TRANSPORTATION REQUIREMENTS
DOT CLASS: NA
UN NUMBER: NA
IMCO CLASS: NA
OTHER: NA

PRECAUTIONARY LABELING
NONE

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY
STANDARDS AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE THE CONDITIONS OF HANDLING AND
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NA= NOT APPLICABLE
ND= NO DATA FOUND