MATERIAL SAFETY DATA SHEET

Product Name: F-2016
Product id: 9239
Revision: 6
Revision date: 22/12/2009
Supersedes: 06/08/2006

1. Identification of the substance & the company

Chemical name: Tetrabromobisphenol A - Tetrabromobisphenol A diglycidyl ether
Chemical formula: (C21H20Br4O4 . C15H12Br4O2) x
Chemical family: Brominated epoxy resin
Molecular weight: 1600
Type of product and use: A flame retardant additive for thermoplastic and thermoset polymers
Supplier: ICL-IP America Inc.
622 Emerson Road - Suite 500
St Louis, Missouri 63141, USA
Tel:(314)983-7884   Fax:(314)983-7607
Emergency Telephone: Chemtrec (800)424-9300

2. Hazards identification

Emergency overview: White powder which is not hazardous

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrabromobisphenol A - Tetrabromobisphenol A diglycidyl ether</td>
<td>68928-70-1</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

4. First-aid measures

Eye contact: Holding the eyelids apart, flush eyes promptly with copious flowing water for at least 20 minutes. Get medical attention immediately.
Skin contact
Remove contaminated clothing. Wash skin thoroughly with mild soap and plenty of water for at least 15 minutes. Wash clothing before re-use. Get medical attention immediately.

Inhalation
In case of dust inhalation or breathing fumes released from heated material, remove person to fresh air. Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately.

Ingestion
If swallowed, wash mouth thoroughly with plenty of water and give water to drink. Get medical attention immediately.

NOTE: Never give an unconscious person anything to drink.

Notes to the physician
Material with low toxicity. No specific antidote. Treat symptomatically and supportively. In case of ingestion induce vomiting in alert patient.

5. Fire - fighting measures

Suitable extinguishing media
Material is not combustible. Use extinguishing media appropriate to surrounding fire conditions.

Fire fighting procedure
Cool containers with water spray. In closed stores, provide fire-fighters with self-contained breathing apparatus in positive pressure mode.

Unusual fire and explosion hazards
When heated to decomposition, may release poisonous fumes of HBr.

6. Accidental release measures

Personal precautions
Wear respirator, chemical safety goggles, rubber gloves and boots.

Methods for cleaning up
Sweep up, place in a bag and hold for waste disposal or possible re-use. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

7. Handling and storage

Handling
Keep containers tightly closed. Avoid bodily contact.

Storage
Store in a dry, cool, well-ventilated area.

8. Exposure controls / personal protection

Exposure Limits :

<table>
<thead>
<tr>
<th>Components</th>
<th>ACGIH-TLV Data</th>
<th>OSHA (PEL) Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrabromobisphenol A-Tetrabromobisphenol A diglycidyl ether 68928-70-1</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>
Ventilation requirements
Ventilation must be sufficient to maintain TLV-TWA below 3 mg/m³, respirable particles, and 10 mg/m³, inhalable particles (ACGIH recommendation for Particles (Insoluble or poorly soluble) Not Otherwise Specified (PNOS)).

Personal protective equipment:
- Respiratory protection Dust respirator
- Hand protection Protective gloves
- Eye protection Chemical safety goggles
- Skin and body protection Body covering clothes and boots

Hygiene measures
Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking. Safety shower and eye bath should be provided.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>White powder</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>Not applicable (decomposes)</td>
</tr>
<tr>
<td>Softening point/range</td>
<td>105-121°C</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt;250°C (ASTM D93 PMOC)</td>
</tr>
<tr>
<td>Flammable/Explosion limits</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not self-ignitable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>Not applicable under standard conditions</td>
</tr>
<tr>
<td>Evaporation rate (ether=1)</td>
<td>Not applicable under standard conditions</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not applicable under standard conditions</td>
</tr>
<tr>
<td>Solubility:</td>
<td></td>
</tr>
<tr>
<td>- Solubility in water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>- Solubility in other solvents</td>
<td>Soluble in DMF, methyl cellulose, toluene, dimethylacetamide</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.8</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>340°C</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Stable under normal conditions</td>
</tr>
<tr>
<td>Materials to avoid</td>
<td>None known</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>Heating above decomposition temperature</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Hydrogen bromide</td>
</tr>
<tr>
<td>Hazardous polymerization</td>
<td>Will not occur</td>
</tr>
</tbody>
</table>

11. Toxicological information

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td></td>
</tr>
<tr>
<td>- Rat oral LD50</td>
<td>&gt; 2,000 mg/kg</td>
</tr>
<tr>
<td>- Eye irritation (rabbit)</td>
<td>Not irritant</td>
</tr>
<tr>
<td>- Dermal irritation (rabbit)</td>
<td>Not irritant</td>
</tr>
<tr>
<td>Dermal sensitization</td>
<td>Not a sensitizer</td>
</tr>
<tr>
<td>Chronic toxicity</td>
<td>Not available</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>Not mutagenic by the Ames Test</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Not classified by IARC</td>
</tr>
<tr>
<td></td>
<td>Not included in NTP 11th Report on Carcinogens</td>
</tr>
</tbody>
</table>
12. Ecological information

Information on ecological effects
No information available

13. Disposal considerations

Waste disposal
Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state and local environmental regulations when disposing of this material.

14. Transportation information

DOT
Not regulated

IMO
Not regulated

ICAO/IATA
Not regulated

15. Regulatory information

USA
Reported in the EPA TSCA Inventory

Canada
Listed in DSL

EU
This product is a polymer.

-EC No.
614-817-0

Japan
ENCS no. 7-1267; 7-1288
ISHL no. 7-1267; 7-1288

Australia
Listed in AICS

New Zealand Inventory
Listed in NZIoC

China inventory
Listed

Korea
Listed in ECL (KE-23977)

Philippines
Listed in PICCS

16. Other information

This data sheet contains changes from the previous version in section(s)
1, 3 (not ANSI), 9, 13, 15
Health, Safety & Environment Policy
We will strive to ensure that our operations and products meet the needs of the present global community without compromising the ability of future generations to meet their needs.
We accept that the success of our business is dependent on the supply of products and services that will benefit society whilst ensuring human safety and protection of the environment and natural resources.
Within the framework of our commitment to the Responsible Care program, we will provide a healthy and safe work environment for employees and will responsibly manage our products at all stages of their life cycle in order to protect human health and the environment whilst maintaining high production standards of operation.

TO MEET THIS COMMITMENT WE WILL:
Comply with or exceed applicable national and international regulatory requirements and other requirements to which we subscribe.
Communicate openly and actively encourage dialogue with employees, customers and community concerning our products and operations.
Implement documented management systems consistent with and for promotion of the Responsible Care ethics.
Develop and supply products that can be manufactured, transported, used and disposed of safely whilst best meeting the needs of our customers.
Regularly assess, continually improve and responsibly manage health, safety and environmental risks associated with products and processes throughout their life-cycles.
Share knowledge and expertise with others and seek to learn from and incorporate improved practices into our own operations.
Educate and train employees, contractors and customers to improve their HSE performance.
Communicate up-to-date information to enable our workers, customers and other interested parties to handle our products in a safe and environmentally responsible manner.
Endeavor to work with customers, suppliers, distributors and contractors to foster the safe use, transport and disposal of our chemicals.
Support Product Stewardship programs in cooperation with customers, distributors and transporters.

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End of safety data sheet