1. Identification of the substance & the company

Chemical name 2,4,6-Tribromophenol
CAS number 118-79-6
Chemical formula C₆H₃OBr₃
Chemical family Brominated phenol
Molecular weight 330.8
Type of product and use A reactive flame retardant used mainly as an intermediate for higher molecular weight flame retardants. Also used as an ingredient in fungicide and wood preservative formulations.
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 to off-white flakes with a mild and quite pleasant phenolic odour
May cause sensitization by skin contact. Irritant to eyes

Potential Health Effects:
- Eye Contact Irritant
- Skin contact Irritant
May cause sensitization by skin contact.
- Inhalation Irritant to upper respiratory tract. Symptoms include sore throat, coughing, shortness of breath and nasal irritation.
- Ingestion Symptoms of over exposure include sore throat, abdominal pain, nausea and vomiting.
Severe poisoning may cause methemoglobinemia
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Potential environmental effects:
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4,6-Tribromophenol</td>
<td>118-79-6</td>
<td>99</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:
No specific antidote. Treat symptomatically and supportively.
5. Fire - fighting measures

Suitable extinguishing media  
Carbon dioxide, dry chemical powder, alcohol foam or polymer foam.

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 and corrosive fumes of CO, CO₂ and HBr.

6. Accidental release measures

Personal precautions  
Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.

Methods for cleaning up  
Cover with dry lime or soda ash, pick up, keep in closed container and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

Environmental precautions  
Prevent product from entering drains, ditches and rivers.

7. Handling and storage

Handling  
Keep containers tightly closed. Avoid bodily contact.

Storage  
Store in a dry area away from incompatible materials (see "materials to avoid").

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>2,4,6-Tribromophenol</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
<tr>
<td>118-79-6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Manufacturer’s recommendation 5 mg/m³
Ventilation requirements
Ventilation must be sufficient to maintain atmospheric concentration below recommended exposure limit.

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

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

9. Physical and chemical properties

Appearance
White to off-white flakes with a mild and quite pleasant phenolic odour

Boiling point/range
286°C (1013 hPa)

Melting point/range
93°C

Flash point
Not applicable

Flammable/Explosion limits
Not flammable

Auto-ignition temperature
Not applicable

Vapour pressure
0.063 Pa (25°C)

Evaporation rate (ether=1)
Not applicable under standard conditions

Vapor density
11.4

Viscosity
Not applicable

Solubility:
- Solubility in water
50 mg/l at 19°C

- Solubility in other solvents
Soluble in most organic solvents

Specific gravity
2.618

Decomposition temperature
>120°C

Partition coefficient
(n-octanol/water)
Log Pow = 3.7

Explosive properties
There are no chemical groups associated with explosive properties present in the molecule

Oxidising properties
Contain no functional groups that are characterized as oxidants

Particle size:
Not available

10. Stability and reactivity

Stability
Stable under normal conditions.
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Materials to avoid: Strong oxidizers, acids and bases

Conditions to avoid: Heating above decomposition temperature
Hazardous decomposition products: Hydrogen bromide, carbon dioxide and carbon monoxide
Hazardous polymerization: Will not occur

11. Toxicological information

Acute toxicity:
- Rat oral LD50: 3704 mg/kg
- Rat dermal LD50: >2000 mg/kg
- Rat inhalation LC50: >5 mg/L
- Eye irritation (rabbit): Moderate irritant
- Dermal irritation (rabbit): Not irritant

Acute dermal sensitization: Produces 75% sensitization rate (Magnusson & Kligman maximisation study)

Sub-acute toxicity:
- NOAEL: 150 mg/kg/day (4 weeks oral rat), Based on systemic toxicity

Chronic toxicity: Repeated skin contact may cause dermatitis.

Mutagenicity: Not mutagenic by the Ames Test
Clastogenic in chromosome aberration test with Human lymphocytes.
Was found to be not mutagenic in the micronucleus test with mice erythrocytes in bone marrow.

Carcinogenicity: Not classified by IARC
Not included in NTP 11th Report on Carcinogens

Reproductive toxicity: The NOAELs for reproductive/developmental toxicity are considered to be 1000 mg/kg/day for parents, and 300 mg/kg/day for F1 generation.
12. Ecological information

Information on ecological effects

The product was analysed for polybrominated p-Dibenzodioxins and Dibenzofurans contamination.

The results show that no polybrominated Dibenzodioxins and Dibenzofurans higher than the limits of quantitation according to the Toxic Substance Control Act (TSCA) 40/CFR 766.27 are present.

Also the limits of the german ordinance (Chemikalien-Verbotsverordnung) for polybrominated Dibenzodioxins and Dibenzofurans are fulfilled.

Aquatic toxicity:
- 96 Hour-LC50, Fish 6.6 mg/l (fathead minnow)
  ca.1 mg/l (carp)
- 48 Hour-EC50, Daphnia magna 0.26 mg/l
- 72 Hour-EC50, Freshwater algae 0.4 mg/l

Avian toxicity:
- Oral LD50, Bobwhite quail >2000 mg/kg

Biodegradation

Undergoes microbial degradation in anoxic marine sediments via progressive debromination.

Degradation by Pseudomonas sp. 200 mg/l at 30°C.

Bioaccumulative potential

Not bioaccumulative

Reproduction

The No Observed Effect Concentration (NOEC) for reproduction in Daphnia magna after exposure of 21 day is 150 ug/l.

13. Disposal considerations

Waste disposal

Treat the solid waste and packaging waste via an incinerator equipped with an adequate gas cleaning system or send to a controlled landfill.

Observe all federal, state and local environmental regulations when disposing of this material.

14. Transportation information

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DOT
Proper shipping name: Environmentally hazardous substance, solid, n.o.s (Tribromophenol)
Class: 9 - Miscellaneous Hazardous Material
Label: 9
Marking: Marine Pollutant
Packing Group: III

IMO
Proper shipping name: Environmentally hazardous substance, solid, n.o.s (Tribromophenol)
Class: 9 - Miscellaneous Dangerous Substances and Articles
Label: 9
Marking: Marine Pollutant
Packing Group: III

ICAO/IATA
Class: 9
Hazard label(s): Miscellaneous
Packing group: III
Marking: Environmentally hazardous substance

15. Regulatory information

USA
Reported in the EPA TSCA Inventory.

Canada
Listed in DSL

EU
Reported in EINECS

Japan
ENCS no. (3)-959,
ISHL no. (3)-959,

Australia
Listed in AICS

New Zealand Inventory
Listed in NZIoC

China inventory
Listed

Korea
Listed in ECL (KE-34019)

Philippines
Listed in PICCS

Switzerland
Listed in Giftliste 1 (G-3150)
16. Other information

This data sheet contains changes from the previous version in section(s)
2 & 3 (not ANSI), 7, 9, 11, 12, 15 (not ANSI)

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
MATERIAL SAFETY DATA SHEET

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In an event of discrepancy between the contents of this MSDS and the English version of it, the English version shall prevail.

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End of safety data sheet