

PRODUCT NAME: TRIMETHYL GALLIUM

1. Chemical Product and Company Identification

BOC Gases,
Division of
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6

TELEPHONE NUMBER: (908) 464-8100

24-HOUR EMERGENCY TELEPHONE NUMBER:

CHEMTREC (800) 424-9300

TELEPHONE NUMBER: (905) 501-1700

24-HOUR EMERGENCY TELEPHONE NUMBER:

(905) 501-0802

EMERGENCY RESPONSE PLAN NO: 20101

PRODUCT NAME: TRIMETHYL GALLIUM

CHEMICAL NAME: Trimethyl Gallium

COMMON NAMES/SYNONYMS: TMG, Trimethylgallane, Trimethylgallium

TDG (Canada) CLASSIFICATION: 4.2

WHMIS CLASSIFICATION: B6, E, D2B

PREPARED BY: Loss Control (908)464-8100/(905)501-1700

PREPARATION DATE: 6/1/95

REVIEW DATES: 6/7/96

2. Composition, Information on Ingredients

INGREDIENT	% VOLUME	PEL-OSHA ¹	TLV-ACGIH ²	LD ₅₀ or LC ₅₀ Route/Species
Trimethyl Gallium FORMULA: (CH ₃) ₃ Ga CAS: 1445-79-0 RTECS #: Not Available	100.0	Not Available	Not Available	Not Available

¹ As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

² As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

3. Hazards Identification

EMERGENCY OVERVIEW

Corrosive to exposed tissues. Inhalation of vapors may result in pulmonary edema and chemical pneumonitis. Exposure to this material may result in toxicity to the kidneys and bone marrow. This material spontaneously combusts in air.

ROUTE OF ENTRY:

Skin Contact Yes	Skin Absorption No	Eye Contact Yes	Inhalation Yes	Ingestion No
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PRODUCT NAME: TRIMETHYL GALLIUM

HEALTH EFFECTS:

Exposure Limits No	Irritant Yes	Sensitization No
Teratogen No	Reproductive Hazard No	Mutagen No
Synergistic Effects None reported		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

EYE EFFECTS:

May cause severe burns of eye tissue and possible permanent damage.

SKIN EFFECTS:

May cause severe burns and residual scarring of tissue. Deep painful burns may result from contact with pure product since it will spontaneously ignite upon contact with air and reacts violently with water. Exposure to fumes during decomposition or fire may produce skin rash.

INGESTION EFFECTS:

Ingestion is unlikely; however, gastrointestinal burns may result.

INHALATION EFFECTS:

Inhalation of fire decomposition products may cause metallic taste, irritation of mucous membranes and muscle weakness. Inhalation of pure product will cause burns of the upper respiratory tract and burns of the lung tissue, likely resulting in pulmonary edema and associated complications.

NFPA HAZARD CODES

Health: 3
Flammability: 4
Reactivity: 2

HMS HAZARD CODES

Health: 3
Flammability: 4
Reactivity: 2

RATINGS SYSTEM

0 = No Hazard
1 = Slight Hazard
2 = Moderate Hazard
3 = Serious Hazard
4 = Severe Hazard

4. First Aid Measures

EYES:

PERSONS WITH POTENTIAL EXPOSURE TO TRIMETHYL GALLIUM SHOULD NOT WEAR CONTACT LENSES. Immediately flush with water for at least 15 minutes including under the eyelids. Obtain immediate medical attention.

SKIN:

Immediately remove contaminated clothing and any excess material off skin. Flush affected area with plenty of water and get medical attention.

INGESTION:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF INGESTION SINCE DEEP PENETRATING BURNS ARE LIKELY.

PRODUCT NAME: TRIMETHYL GALLIUM

INHALATION:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVER EXPOSURE TO TRIMETHYL GALLIUM. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Unconscious persons should be moved to an uncontaminated area and given artificial resuscitation and supplemental oxygen. Keep the victim warm and quiet. Assure that mucus or vomited material does not obstruct the airway by positional drainage. Delayed pulmonary edema may occur. Keep patient under medical observation for at least 24 hours.

5. Fire Fighting Measures

Conditions of Flammability: This material spontaneously combusts in air		
Flash point: Not Available	Method: Not Applicable	Autoignition Temperature: Not Available
LEL(%): Not Available	UEL(%): Not Available	
Hazardous combustion products: Oxides of gallium		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: Not Available		

FIRE AND EXPLOSION HAZARDS:

PYROPHORIC! SPONTANEOUSLY IGNITES IN AIR. Reacts violently with water. Smoke may contain toxic oxides of gallium.

EXTINGUISHING MEDIA:

Use dry chemical powder followed by dry sand or dolomite. DO NOT USE WATER, FOAM OR HALOGENS. Reigniting may occur. Use caution when handling extinguished material.

FIRE FIGHTING INSTRUCTIONS:

Wear self-contained breathing apparatus and full protective clothing including hats, gloves and boots. Use caution when cleaning up extinguished material since re-ignition may occur when material is disturbed. Avoid contact at all times. If material is splashed on clothing, remove as soon as possible.

6. Accidental Release Measures

Evacuate all personnel from affected areas. Use appropriate protective equipment. Cover spill with dry sand or dolomite and allow to completely decompose or let fire burn out, if safe to do so. Place into appropriate container for disposal. For emergency assistance, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location. Do NOT use water.

7. Handling and Storage

Wear flame resistant clothing when handling. Store in cool, dry, well ventilated area. Keep containers tightly closed. Avoid contact with skin, eyes and clothing.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

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8. Exposure Controls, Personal Protection

EXPOSURE LIMITS¹:

INGREDIENT	% VOLUME	PEL-OSHA ²	TLV-ACGIH ³	LD ₅₀ or LC ₅₀ Route/Species
Trimethyl Gallium FORMULA: (CH ₃) ₃ Ga CAS: 1445-79-0 RTECS #: Not Available	100.0	Not Available	Not Available	Not Available

¹ Refer to individual state or provincial regulations, as applicable, for limits which may be more stringent than those listed here.

² As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

³ As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

ENGINEERING CONTROLS:

Use glove box or dry inert atmosphere to exclude oxygen.

EYE/FACE PROTECTION:

Chemical safety goggles.

SKIN PROTECTION:

Wear heat and fire resistant gloves and flame resistant clothing when handling.

RESPIRATORY PROTECTION:

Positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be used and available for emergency use and when handling in inert atmospheres.

OTHER/GENERAL PROTECTION:

Safety shoes, safety shower, eyewash "fountain", face shield.

9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Liquid	
Vapor pressure at 0 °C	: 64.5	psia
Vapor density (Air = 1)	: Not Available	
Evaporation point	: Not Available	
Boiling point	: Not Available	°F
	: 57.5	°C
Freezing point	: Not Available	°F
	: -15.8	°C
pH	: Not Available	
Specific gravity	: 1.1	
Oil/water partition coefficient	: Not Available	
Solubility (H ₂ O)	: Reacts violently	
Odor threshold	: Not Available	
Odor and appearance	: A colorless liquid	

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10. Stability and Reactivity

STABILITY:

Reactive

INCOMPATIBLE MATERIALS:

Air, water, acids and oxidizers. Spontaneously flammable in air. Reacts violently with water, giving off flammable methane gas and gallium hydroxide.

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition or combustion may result in release of CO, CO₂ and toxic oxides of gallium. Reaction with water liberates methane.

HAZARDOUS POLYMERIZATION:

Will not occur

11. Toxicological Information

Radioactive and stable GALLIUM in therapeutic doses has been reported to cause dermatitis, gastrointestinal disturbance and bone marrow depression. Trimethylgallium may result in similar effects, however no information is available regarding systemic effects of trimethylgallium.

Gallium has been shown to cause kidney damage in dogs when chronically injected intravenously; degenerative changes in the gastric glands and mucosa and kidney damage have occurred in mice when chronically treated subcutaneously.

12. Ecological Information

No data given.

13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

Spill residues or product is regulated as a hazardous waste under RCRA ID # D001 or D003. Contact local, state or federal EPA for proper disposal.

14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Pyrophoric liquids, n.o.s. (Trimethyl Gallium)	Pyrophoric liquids, n.o.s. (Trimethyl Gallium)
HAZARD CLASS:	4.2	4.2
IDENTIFICATION NUMBER:	UN 2845	UN 2845
SHIPPING LABEL:	SPONTANEOUSLY COMBUSTIBLE	SPONTANEOUSLY COMBUSTIBLE

Packing Group: I

MSDS: G-160

Revised: 6/7/96

15. Regulatory Information

SARA TITLE III NOTIFICATIONS AND INFORMATION

SARA TITLE III - HAZARD CLASSES:

Acute Health Hazard
Chronic Health Hazard
Fire Hazard
Reactivity Hazard

16. Other Information

WARNING! THIS PRODUCT IS BEING SOLD FOR RESEARCH AND DEVELOPMENT PURPOSES ONLY. THE TOXICOLOGICAL AND ECOLOGICAL PROPERTIES OF THIS PRODUCT HAVE NOT BEEN DETERMINED AND ITS USE OR HANDLING MAY BE HAZARDOUS. THE PRODUCT SHOULD ONLY BE USED UNDER THE SUPERVISION OF A TECHNICALLY QUALIFIED INDIVIDUAL FOLLOWING PRUDENT LABORATORY PRACTICES FOR HANDLING SUBSTANCES OF UNKNOWN TOXICITY.

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).