

MATERIAL
SAFETY
DATA SHEET

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| PRODUCT NAME Trimethylboron | CAS# 593-90-8 |
| TRADE NAME AND SYNONYMS Trimethyl borane, trimethyl borine, TMB | DOT I.D. NO. UN 1953 |
| CHEMICAL NAME AND SYNONYMS Trimethylboron | DOT HAZARD CLASS Division 2.3 |
| ISSUE DATE AND REVISIONS Revised December 2007 | FORMULA B(CH ₃) ₃ |

HEALTH HAZARD DATA

EMERGENCY OVERVIEW

Trimethylboron is a colorless, flammable gas with a repulsive, suffocating odor. Its immediate health hazards are that it is a poison gas and may cause thermal burns. It is a flammable gas that is usually pyrophoric (autoigniting in air). It may form mixtures with air that do not autoignite, but are flammable or explosive. Trimethylboron is violently reactive with water, oxidizers and halogens. Contents of cylinder may be combination of gas and liquefied gas.

SYMPTOMS OF EXPOSURE

Primary Routes of Exposure: Eyes, skin, and inhalation of combustion products.
Ingestion: Ingestion is an unlikely mode of entry as the material is pyrophoric.
Skin Contact: Gas bursts in to flame in air. Contact with skin will therefore cause thermal burns.
Inhalation: Vapor and smoke may be irritating to the nose, mucous membranes and respiratory tract and cause coughing, wheezing, and sore throat.
Eye Contact: Direct contact of gas with the eyes will cause thermal burns and possible blindness.
Acute Health Effects: May be irritating to skin, eyes and respiratory tract and cause eye, skin burns, dyspnea (breathing difficulty), and pulmonary edema. Gas may cause thermal burns.

TOXICOLOGICAL PROPERTIES

Acute Data (by route): Exposure by inhalation may cause headache or nausea. Reaction with air or water may produce irritation or thermal burns to skin, eyes and mucous membranes.
Chronic and Subchronic Data: None available. This material is not listed in the Registry of Toxic Effects of Chemical Substances (RTECS); no information on its carcinogenicity is available.
 No exposure guidelines for this material are available. The Time Weighted Average (TWA) of 7 ppm recommended by HSG is based on the limit for boron oxide of 10 mg/m³ and the assumption that trimethylboron will be completely converted to oxides upon contact with the air.

RECOMMENDED FIRST AID TREATMENT

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO TRIMETHYLBORON. RESCUERS SHOULD BE EQUIPPED WITH ADEQUATE PERSONAL PROTECTIVE APPARATUS.

Ingestion: Induce vomiting only if directed by medical personnel.
Skin Contact: Remove contaminated clothing and flush skin with water for no less than 15 minutes. Treat thermal burns by assuring that affected area is cool by flushing with cool water, then apply dry sterile dressings.
Inhalation: Remove patients to fresh air. Administer rescue breathing if affected person is not breathing spontaneously. Qualified personnel may give oxygen if breathing is difficult.
Eye Contact: Immediately flush eyes with copious quantities of water and continue flushing for at least 30 minutes. Get immediate medical attention.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Reaction with water releases methane.

PHYSICAL DATA

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| BOILING POINT -20.2 °C (-4.4 °F) | VAPOR PRESSURE (AT 20 °C, 70 °F) 4.1 bar (45 psig) |
| MELTING POINT -161.5 °C (-258.7 °F) | VAPOR DENSITY (AT 20 °C, 70 °F) 2.3 g/L |
| MOLECULAR WEIGHT 55.92 | SPECIFIC GRAVITY (WATER=1) 0.625 at -100°C (-148 °F) |
| SOLUBILITY IN WATER N/A | PH N/A |
| APPEARANCE AND ODOR Colorless gas with repulsive and suffocating odor. | |

FIRE AND EXPLOSION HAZARD DATA

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| FLASH POINT (Method used) N/A | EXTINGUISHING MEDIA N/A | FLAMMABLE LIMITS % BY VOLUME LEL N/A UEL N/A |
| SPECIAL FIRE FIGHTING PROCEDURES Evacuate all personnel from danger area. Stop the flow of gas. If the flow cannot be stopped, allow the entire contents of the cylinder to burn. Cool the cylinder and surroundings with water from a suitable distance. Extinguishing the fire without stopping the flow of gas may permit the formation of ignitable or explosive mixtures with air. These mixtures may propagate to a source of ignition. | | |
| UNUSUAL FIRE AND EXPLOSION HAZARDS Excessive pressure may develop in gas cylinders exposed to fire, which may result in explosion, regardless of the cylinder's content. Cylinders with pressure relief devices (PRD's) may release their contents through such devices if the cylinder is exposed to fire. Cylinders without PRD's have no provision for controlled release and are there more likely to explode if exposed to fire. | | |

REACTIVITY DATA

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| STABILITY | | CONDITIONS TO AVOID |
| Unstable | | Sources of ignition, exposure to air or water. |
| Stable | X | |
| INCOMPATIBILITY (Materials to avoid) Air, Oxidizers, halogens, halogenated hydrocarbons, water. | | |
| HAZARDOUS POLYMERIZATION | | HAZARDOUS THERMAL DECOMPOSITION PRODUCTS |
| May Occur | | Boron oxides, methane, carbon dioxide, carbon monoxide, organic fumes. |
| Will Not Occur | X | |

SPILL OR LEAK PROCEDURES

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| STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED If the release is not contained in an appropriate device or system, all personnel not appropriately protected must evacuate the contaminated spaces. Consider evacuation of additional areas, as a precaution against the spread of the release or subsequent explosion or fire. Most, but not all, releases of trimethylboron into air will autoignite, producing boron oxide, a white powder that may be suspended in the air if produced in this manner. As not all leaks will auto ignite, consider the possible formation of ignitable or explosive mixtures with air. |
| WASTE DISPOSAL METHOD Waste disposal must be in accordance with appropriate Federal, State, and local regulations. For emergency disposal assistance, contact HSG for specific advice. |

SPECIAL PROTECTION INFORMATION

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| RESPIRATORY PROTECTION (Specify type) Positive pressure, full face, air supplied breathing apparatus should be used for work within the secondary containment equipment if a leak is suspected or the primary containment is to be opened, e.g., for a cylinder change. Air supplied breathing apparatus is required for response to demonstrated or suspected releases from the primary containment. | |
| MECHANICAL (Gen.) Local exhaust is required. Secondary containment, with appropriate exhaust gas treatment, is strongly encouraged and is required in some jurisdictions. | SPECIAL Purge all primary containment systems with a nonreactive gas, such as nitrogen, before introducing trimethylboron. |
| EYE/FACE PROTECTION Goggles and face shield that provides splash and impact protection for the face and eyes. For handling sealed cylinders, wear safety glasses. | PROTECTIVE GLOVES Wear appropriate protective clothing and loose fitting gloves. |
| OTHER PROTECTIVE EQUIPMENT Wear appropriate protective footwear when moving cylinders. | OTHER N/A |

SPECIAL PRECAUTIONS*

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| SPECIAL LABELING INFORMATION | |
| DOT Shipping Name: Trimethylboron, Compressed Gas DOT Shipping Label: Toxic Gas, Flammable Gas | DOT Hazard Class: Division 2.3 I.D. No.: UN 1953 |
| SPECIAL HANDLING RECOMMENDATIONS Handle this material only in sealed, purged systems. The design of handling systems for hazardous materials should be performed by a competent, experienced professional. Consider the use of doubly-contained piping; diaphragm or bellows sealed, soft seat valves; backflow prevention devices; flash arrestors; and flow monitoring or limiting devices. Use only in well-ventilated areas. Valve protection caps must remain in place unless cylinder is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or system. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. | |
| SPECIAL STORAGE RECOMMENDATIONS Protect the cylinders from direct sunlight, precipitation, mechanical damage, and temperatures above 55 °C (130 °F). Ship and store cylinders with the outlet plug and valve protective cap in place. | |
| OTHER RECOMMENDATIONS OR PRECAUTIONS Clean up consists of passing the entire gas volume of the enclosure through appropriate exhaust gas treatment equipment (EGTE). Purge the enclosure with a non-reactive gas, such as nitrogen, through the EGTE until an acceptably low level of contamination remains. Equipment contaminated by this material must then be cleaned or decommissioned appropriately. | |

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