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MSDS: Diborane

PRODUCT INFORMATION

PRODUCT: Diborane

TRADE NAME: Diborane or Boron Hydride

CHEMICAL NAME: Diborane or Boron Hydride

SYNONYMS: Boroethane

FORMULA: B₂H₆

CHEMICAL FAMILY: Metal Hydride

SUPPLIER'S NAME: MEGS Inc.

SUPPLIER'S ADDRESS: 2675 De Miniac
Ville St-Laurent, Qc, H4S 1E5

EMERGENCY PHONE NUMBER: (514) 956-7503

MOLECULAR WEIGHT: 27.68

PRODUCT USE: Various

**PRODUCT IDENTIFICATION UN 1911
NUMBER:**

HAZARDOUS INGREDIENTS

CHEMICAL ID	CONCENTRATION	CAS #	LD(50)	LC(50)
Diborane	100%	19287-45-7	None published	1h1-Rat 50 ppm4 h

PHYSICAL DATA

PHYSICAL STATE: Gas and liquid under pressure

APPEARANCE: Colorless gas

ODOR: Characteristic sickly, sweet odor

ODOR THRESHOLD: Unknown

SPECIFIC GRAVITY (H₂O = 1): 0.421

VAPOR PRESSURE: Not applicable (gas)

VAPOR DENSITY (air = 1): 0.95

EVAPORATION RATE: Unknown

BOILING POINT: -92.5°C

FREEZING POINT: -165.5°C

pH: Not applicable (gas)

GAS DENSITY: 1.136 kg/m³ @ 15°C, 101.3 kPa

COEFFICIENT OF WATER/OIL: Reacts with water to produce

DISTRIBUTION: hydrogen gas

FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY:	Pure diborane is flammable in air over a very wide range. It will ignite spontaneously in moist air at room temperatures.
MEANS OF EXTINCTION:	Diborane reacts with most extinguishing media such as water, carbon dioxide, chemical powders and halogenated compounds. Attempt to stop the flow of gas and allow fire to burn itself out. Use water spray to cool surrounding containers. The heat of combustion from a diborane fire is greater than that from a similar hydrocarbon such as in an ethane fire.
FLASHPOINT AND METHOD OF DETERMINATION:	-90°C
UPPER EXPLOSION LIMIT (% BY VOL):	98
LOWER EXPLOSION LIMIT (% BY VOL):	0.9
AUTO-IGNITION TEMPERATURE:	38°C
FLAMMABILITY CLASSIFICATION:	Class 1, Group not specified
HAZARDOUS COMBUSTION PRODUCTS:	Hydrogen and higher boranes
EXPLOSION DATA:	Yes, with oxides, ammonia, alcohols, lithium and similar reactive metals, halogens and halogen compounds.
SENSITIVITY TO STATIC DISCHARGE:	Yes

REACTIVITY DATA

CHEMICAL STABILITY: Unstable, avoid elevated

temperature. Decomposes at room temperature

INCOMPATIBLE MATERIALS: Oxidizing agents, aluminum, lithium, halogenated substances

CONDITIONS OF REACTIVITY: Elevated temperatures and room temperatures with moisture

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen and higher boranes, particularly tetraborane

TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

SKIN CONTACT: Burns result from contact with diborane

SKIN ABSORPTION: None

EYE: Irritant to the eye, burns result from contact.

INHALATION: It is an irritant to the respiratory system due to the formation of boric acid. Exposure to low concentrations are likely to produce central nervous system symptoms such as, fatigue, drowsiness, shortness of breath, coughing and eventual convulsions and death. Prolonged exposure to very low concentrations may result in dizziness, vertigo, chills, fatigue or muscular weakness.

INGESTION: None

ACUTE OVER EXPOSURE EFFECTS: Its toxicity seems to be similar to that for phosgene, chlorine, fluorine, and arsine. Damage to the lungs resulting in pulmonary edema will most probably occur as well as kidney and liver damage. The signs of the intoxication may be delayed for up to 24 hours or occur immediately after the exposure.

CHRONIC OVER EXPOSURE EFFECTS: None known

EXPOSURE LIMITS: TWA = 0.1 molar ppm (ACGIH 1995-1996)

IRRITANCY OF PRODUCT: None known

SENSITIZATION TO MATERIAL: None known

CARCINOGENICITY, REPRODUCTIVE EFFECTS: None known

TERATOGENICITY, MUTAGENICITY: None known

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: Higher boranes

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Plastic gloves. Safety goggles or glasses. Safety shoes, safety shower.

SPECIFIC ENGINEERING CONTROLS: Diborane is non-corrosive and most common structural materials (except aluminum) may be used. It is also compatible with ordinary glass, Pyrex® and quartz. Kel-F® and Teflon® are the preferred gasketing materials. Acceptable metals include, carbon steel stainless steel, copper, brass among others.

LEAK AND SPILL PROCEDURES: EVACUATE ALL PERSONNEL FROM AFFECTED AREA.

Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is on container or container valve, contact the closest MEGS location.

WASTE DISPOSAL: Do not attempt to dispose of 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 MEGS for proper disposal. For emergency disposal, contact the closest MEGS location.

HANDLING PROCEDURES AND EQUIPMENT: USE ONLY IN WELL-VENTILATED AREAS.

Valve protection caps must remain in place unless container is secured with valve outlet piped to the point of use. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. 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. Do not tamper with (valve) safety device. Close valve after each use and when empty.

STORAGE REQUIREMENTS: Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 52°C. Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

TDG CLASSIFICATION: 2.3 (2.1)

WHMIS CLASSIFICATION: A, B, D1, F

SPECIAL SHIPPING INFORMATION: Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

FIRST AID MEASURES

SPECIFIC FIRST AID PROCEDURES: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO DIBORANE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

INHALATION: Move affected person to an uncontaminated area. If breathing has stopped, give assisted respiration. Oxygen should be administered by a qualified person. Keep victim warm and calm. Seek immediate medical assistance. Continued treatment should be symptomatic and supportive.

EYE CONTACT: PERSONS WITH POTENTIAL EXPOSURE TO DIBORANE SHOULD NOT WEAR CONTACT LENSES.

Flush contaminated eye(s) with copious quantities of water. Part eyelids to assure complete flushing. Continue for a minimum of 15 minutes.

SKIN CONTACT: Flush affected area with copious quantities of water. Remove affected clothing as rapidly as possible.

PREPARATION INFORMATION

PREPARED BY: Safety Department

DATE PREPARED: 09/01/1999

LAST REVISION DATE: 05/21/2002

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