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MSDS: Deuterium

PRODUCT INFORMATION

PRODUCT: Deuterium

TRADE NAME: Deuterium or Normal Deuterium

CHEMICAL NAME: Deuterium or Normal Deuterium

SYNONYMS: Heavy Hydrogen

FORMULA: D₂ or ²H₂

CHEMICAL FAMILY: Inorganic Flammable Gas

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: 4.02

PRODUCT USE: Various

**PRODUCT IDENTIFICATION UN 1957
NUMBER:**

HAZARDOUS INGREDIENTS

CHEMICAL ID	CONCENTRATION	CAS #	LD(50)	LC(50)
	100%			
Deuterium		7782-39-0	None	None

PHYSICAL DATA

PHYSICAL STATE: Gas under pressure

APPEARANCE: Colorless

ODOR: Odorless gas

ODOR THRESHOLD: Not applicable

SPECIFIC GRAVITY (H₂O = 1): See Vapor Density (air = 1)

VAPOR PRESSURE: Not applicable (gas)

VAPOR DENSITY (air = 1): 0.139

EVAPORATION RATE: Not applicable (gas)

BOILING POINT: -249.58°C

FREEZING POINT: -254.43°C

pH: Not applicable

GAS DENSITY: 0.0853 kg/m³ @ 15°C, 101.3 kPa

COEFFICIENT OF WATER/OIL: Very slightly soluble in water

DISTRIBUTION:

FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY: Flammable gas in air over a very wide range

MEANS OF EXTINCTION: Water, carbon dioxide, dry chemical

FLASHPOINT AND METHOD OF DETERMINATION: Not applicable (gas)

UPPER EXPLOSION LIMIT (% BY VOL): 75

LOWER EXPLOSION LIMIT (% BY VOL): 5

AUTO-IGNITION TEMPERATURE: 570°C

FLAMMABILITY CLASSIFICATION: Class 1, Group B

HAZARDOUS COMBUSTION PRODUCTS: None

EXPLOSION DATA: Yes, with most oxidizers

SENSITIVITY TO STATIC DISCHARGE: Yes

REACTIVITY DATA

CHEMICAL STABILITY: Stable

INCOMPATIBLE MATERIALS: None

CONDITIONS OF REACTIVITY: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

SKIN CONTACT: None

SKIN ABSORPTION: None

EYE: None

INHALATION: High concentrations of deuterium so as to exclude an adequate supply of oxygen to the lungs causes dizziness, deeper breathing due to air hunger, possible nausea and eventual unconsciousness.

INGESTION: None

ACUTE OVER EXPOSURE EFFECTS: Deuterium is inactive biologically and essentially nontoxic; therefore, the major property is the exclusion of an adequate supply of oxygen to the lungs.

CHRONIC OVER EXPOSURE EFFECTS: None

EXPOSURE LIMITS: Deuterium is defined as a simple asphyxiant. Oxygen levels should be maintained at greater than 18 molar percent at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg. (ACGIH, 1995-1996).

IRRITANCY OF PRODUCT: None

SENSITIZATION TO MATERIAL: None

CARCINOGENICITY, REPRODUCTIVE EFFECTS: None

TERATOGENICITY, MUTAGENICITY: None

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Gloves: any material. Safety goggles or glasses. Safety shoes, safety shower.

SPECIFIC ENGINEERING CONTROLS: Deuterium is noncorrosive and may be used with any common structural material.

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.

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. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems. 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: 2.1

WHMIS CLASSIFICATION: A, B

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 DEUTERIUM. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

INHALATION: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

EYE CONTACT: Not applicable

SKIN CONTACT: Not applicable

PREPARATION INFORMATION

PREPARED BY: Safety Department

DATE PREPARED: 09/01/1999

LAST REVISION DATE: 05/21/2002

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