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MSDS: Silane; Monosilane

PRODUCT INFORMATION

PRODUCT: Silane; Monosilane
TRADE NAME: Silane; Monosilane
CHEMICAL NAME: Silane; Silicon Tetrahydride; Silicane
SYNONYMS: None
FORMULA: SiH₄
CHEMICAL FAMILY: Silicon 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: 32.13
PRODUCT USE: Various
**PRODUCT IDENTIFICATION UN 2203
NUMBER:**

HAZARDOUS INGREDIENTS

CHEMICAL ID	CONCENTRATION	CAS #	LD(50)	LC(50)
Silane	99+%	7803-62-5	None	Inhl-Rat 9600 ppm/4 h

PHYSICAL DATA

PHYSICAL STATE: Gas under pressure
APPEARANCE: Colorless gas with a repulsive odor
ODOR: See above
ODOR THRESHOLD: Unknown
SPECIFIC GRAVITY (H₂O = 1): See Vapor Density (air = 1)
VAPOR PRESSURE: Not applicable (gas)

VAPOR DENSITY (air = 1): 1.11

EVAPORATION RATE: Not applicable (gas)

BOILING POINT: -111.4°C

FREEZING POINT: -186.4°C

pH: Unknown

GAS DENSITY: 1.35 kg/m³ @ 15°C, 101.3 kPa

COEFFICIENT OF WATER/OIL: Insoluble in water

DISTRIBUTION:

FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY: Greater than 3% concentrations are pyrophoric in air

MEANS OF EXTINCTION: Shut off source of silane. Cool surrounding containers with water spray.

FLASHPOINT AND METHOD OF DETERMINATION: Pyrophoric

UPPER EXPLOSION LIMIT (% BY VOL): Pyrophoric

LOWER EXPLOSION LIMIT (% BY VOL): Pyrophoric

AUTO-IGNITION TEMPERATURE: Pyrophoric

FLAMMABILITY CLASSIFICATION: Pyrophoric

HAZARDOUS COMBUSTION PRODUCTS: None

EXPLOSION DATA: Pyrophoric

SENSITIVITY TO STATIC DISCHARGE: Pyrophoric

REACTIVITY DATA

CHEMICAL STABILITY: See table below

INCOMPATIBLE MATERIALS: Air, halogens, other oxidizers

CONDITIONS OF REACTIVITY: See table below

HAZARDOUS DECOMPOSITION PRODUCTS: Silicon and hydrogen above 420°C

FLAMMABILITY OF SILANE IN CERTAIN CARRIER GASES

	Molar % of SiH ₄	Molar % of SiH ₄	Molar % of SiH ₄
Carrier gas	<1%	1% - 3%	<3%
Ar	A	B	C
N ₂	A	B	C
He	A	B	C

A = Nonflammable mixture
B = Probably nonflammable mixture
C = Flammable mixture

TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

SKIN CONTACT: Dermal burns from ignited silane are similar to other thermal burns.

SKIN ABSORPTION: None

EYE: None

INHALATION: Symptoms of inhalation are not well defined. It has been reported that breathing this gas may cause headache or nausea.

INGESTION: None

ACUTE OVER EXPOSURE EFFECTS: Since silane is spontaneously flammable in air (liberating silicon dioxide), its toxicological properties are difficult to determine. Inhalation of low concentrations (probably less than one molar percent) of silane so that spontaneous ignition does not occur could react with basic solutions in the body liberating silicate and hydrogen. Further, with possible hydrolysis in body tissues, silicic acid could be formed.

CHRONIC OVER EXPOSURE EFFECTS: None reported

EXPOSURE LIMITS: TWA = 5 molar ppm.

IRRITANCY OF PRODUCT: See Skin Contact, above.

SENSITIZATION TO MATERIAL: None known

CARCINOGENICITY, REPRODUCTIVE EFFECTS: None known

TERATOGENICITY, MUTAGENICITY: None known

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None known

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Protective gloves. Safety goggles or

glasses. Safety shoes, safety shower.

SPECIFIC ENGINEERING CONTROLS: Pure silane is noncorrosive and may be handled in most common structural materials. Carbon steel, stainless steel, Monel®, and Hastelloy® C are the most commonly used materials. It is also compatible with ordinary glass, Pyrex® and quartz. For gasketing materials, Viton®, Nylon®, Teflon®, and Kel-F® are all satisfactory. Most all silane leaks will ignite in air producing silicon dioxide. Occasionally the silicon dioxide will slow or stop the leak. These leaks are recognizable by the presence of the silicon dioxide and permanent repairs to the leak should be made.

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. Use a pressure reducing regulator when connecting 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. Silane cylinders, whether full or empty, should not be stored with other flammable products.

TDG CLASSIFICATION: 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 SILANE. 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. Medical assistance should be sought immediately. Further treatment should be symptomatic and supportive.

EYE CONTACT: Not applicable

SKIN CONTACT: Dermal burns from ignited silane should be treated as with any thermal burn.

PREPARATION INFORMATION

PREPARED BY: Safety Department

DATE PREPARED: 05/09/1999

LAST REVISION DATE: 06/01/2002

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