

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Monosilane (SiH₄)

Chemical formula	SiH ₄
CAS number	7803-62-5
Transport identifier	UN 2203

1.2 Relevant identified uses

Industrial and professional use in microelectronics and optoelectronics manufacturing. Use only with process-specific engineering controls and a documented risk assessment.

Uses advised against	Intentional inhalation and any use not supported by a task-specific risk assessment.
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1.3 Supplier

SG TRADING L.L.C-FZ

Address	Meydan Grandstand, 6th Floor, Meydan Road, Nad Al Sheba, Dubai, United Arab Emirates
Telephone	+971 4 422 4811
Email	info@sgtrading.biz
Website	https://www.sgtrading.biz

1.4 Emergency and safety contact (WhatsApp)

+1 832 525 5066, available 07:00–22:00 (UTC+3).

SECTION 2: Hazards identification

Emergency Overview

GHS Classification:

Flammable gases, category 1; Pressurized gas; Acute toxicity-inhalation, category 5; Skin corrosion/irritation, category 2; Severe ocular injury/ocular irritation, category 2A; Specific target organ toxicity -one exposure, category 3 (respiratory tract irritation); Specific target organ toxicity-repeated exposure, category 2

Pictogram(s)

Signal word	Danger
Hazard statement(s)	extremely flammable gas, containing pressurized gas; It may explode Extremely flammable gas, containing pressurized gas; May explode when exposed to heat

when exposed to heat, and may be harmful when inhaled, causing skin irritation; Causes severe eye irritation; May cause respiratory tract irritation, prolonged or repeated exposure may cause damage to organs Precautionary statement(s): Precautions:

- Keep away from heat sources, sparks, open flames and hot surfaces.
- Smoking is prohibited.
- -Avoid contact with eyes and skin, and wash thoroughly after operation
- Wear protective gloves, protective glasses and protective masks.
- Avoid inhaling gases. · Incident response:
- -Leaking gas catches fire: Do not put out the fire unless the source of the leak can be safely cut off. If there is no danger, eliminate all ignition sources.
- -Inhalation: If you feel unwell, call the poison control center or seek medical attention.
- -Skin contact: Wash with plenty of soapy water and water. If skin irritation occurs, seek medical attention. Take off contaminated clothes and wash them before reusing them.
- -Eye contact: Rinse carefully with water for a few minutes. If you wear contact lenses and can easily take them out, take out the contact lenses and continue to rinse. If eye irritation persists, seek medical attention.

Safe storage:

- Avoid sunlight and store in a well-ventilated place. Keep the container tightly closed.

Disposal	The product and its contents and containers are disposed of in accordance with national and local regulations.
Physical And Chemical Hazards	Prone to spontaneous combustion when exposed to air.
Health hazards	After inhaling silane vapor, it can cause headache, dizziness, fever, nausea and excessive sweating; In severe cases, the face is pale, the pulse is soft, and the coma is unconscious.
Environmental hazards	may be harmful to the environment.



Flame



Gas cylinder



Exclamation mark



Health hazard

SECTION 3: Composition/information on ingredients

☐ Substance ☐ Mixture Chemical name Concentration CAS No. Silane ≥99.9999% 7803-62-5

SECTION 4: First-aid measures

First aid:

Inhalation	Quickly leave the site to fresh air. Keep the airways open. If you have difficulty breathing, give oxygen. Breathing and heartbeat stop, immediately perform cardiopulmonary resuscitation and seek medical attention.
Skin Contact	Immediately remove contaminated clothing and rinse thoroughly with running water. Seek
medical attention. Eye contact	Separate eyelids immediately and rinse thoroughly with flowing water or normal saline. Seek medical attention.
Advice to protect rescuers	Use personal protective equipment as needed.
Special Tips for Doctors	Treat symptomatically.

SECTION 5: Firefighting measures

Extinguishing media	Quickly cut off the air source, spray with water to protect the person who cut off the air source, and then select the appropriate fire extinguishing agent to extinguish the fire according to the cause of the fire.
Specific hazards arising from the chemical ☐	It can form explosive mixtures when mixed with air. It is easy to burn and explode when exposed to open flame and high heat. It can spontaneously ignite when exposed to air. Violent chemical reactions occur in contact with fluorine, chlorine, etc.
Firefighting precautions and protective measures	Firefighters must wear gas masks and full-body fire suits. In the upwind direction extinguish the fire. Cut off the air source. If the air source cannot be cut off, the flame at the leak is not allowed to be extinguished. Move the container from the fire to an open space whenever possible. The water spray keeps the fire container cool until the fire extinguishment is completed.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: Eliminate all ignition sources. According to the influence area of gas diffusion, the warning area is designated, and irrelevant personnel are evacuated to the safe area from the crosswind direction and upwind direction. It is recommended that emergency responders wear positive pressure self-contained respirators and anti-static clothing. All equipment used during the operation shall be grounded. Do not touch or cross the spill. Cut off the source of the leak as much as possible. If possible, turn the container over so that it escapes gas instead of liquid. The spray-like water suppresses

the steam cloud or changes the flow direction of the steam cloud, preventing the water flow from contacting the leak. It is forbidden to directly impact the leak or source of the leak with water.

Environmental protection measures Prevent gas diffusion through sewers, ventilation systems and confined spaces. Containment and removal methods of leaked chemicals and disposal materials used: Isolate the leak area until the gas has dissipated.

SECTION 7: Handling and storage

Precautions for safe handling Closed operation, fully ventilated. Operators must undergo special training and strictly abide by the operating procedures. It is recommended that operators wear filter gas masks (half masks), anti-static overalls, chemical safety glasses and rubber gloves. Stay away from kindling and heat sources, and smoking is strictly prohibited in the workplace. Use explosion-proof ventilation systems and equipment. Prevent gas leakage into the workplace air. Avoid contact with oxidants, alkalis and halogens. During transfer, cylinders and containers must be grounded and bridged to prevent static electricity. Light loading and unloading during handling to prevent damage to cylinders and accessories. Equipped with corresponding varieties and quantities of fire-fighting equipment and leakage emergency treatment equipment.

Precautions for storage Store in a cool, ventilated warehouse dedicated to flammable gases. The storage temperature should not exceed 30 °C. Keep away from kindling and heat sources. The cylinder temperature should not exceed 52 °C. Keep the container tightly closed. It should be stored separately from oxidants, alkalis, halogens and edible chemicals, and should not be mixed. Adopt explosion-proof lighting and ventilation facilities. It is forbidden to use mechanical equipment and tools that are prone to sparks. The storage area should be equipped with leakage emergency treatment equipment.

SECTION 8: Exposure controls/personal protection

Occupational Exposure limit values

China PC-TWA	6.6 mg/m ³
United States (ACGIH) TLV-TWA	5ppm Biological limit values
Monitoring method	-
Engineering controls	the production process is closed and fully ventilated Individual protection measures, such as personal protective equipment (PPE)
Respiratory system protection	When the concentration in the air exceeds the standard, it is recommended to wear a filter gas mask (half mask). Air respirator should be worn during emergency rescue or evacuation
Eye protection	wear chemical safety glasses
Skin and body protection	wear anti-static overalls
Hand protection	wear rubber gloves

SECTION 9: Physical and chemical properties

Appearance and properties	colorless, irritating gas with foul odor.
pH	Not meaningful Critical Temperature (°C): No data
Melting point (°C)	-185.0
Critical pressure (Mpa)	No data
Boiling point (°C)	-112
Spontaneous ignition temperature (°C)	No data
Flash point (°C)	<-50

Decomposition temperature (□)	No data
Upper explosion limit [% (volume fraction)]	96 Heat of combustion (kJ/mol): No data
Lower explosion limit [% (volume fraction)]	1.4
Saturated vapor pressure (kPa)	no data
Relative liquid density (water = 1)	0.68 (-182 ° C)
Octanol/water partition coefficient	no data
Relative vapor density (air = 1)	1.3 Viscosity (mPa · s): No data
Solubility	Soluble in benzene and carbon tetrachloride.

SECTION 10: Stability and reactivity

Chemical stability	Unstable.
Hazardous reaction	Contact with strong oxidants, oxygen, alkali, halogen and other prohibited compounds, there is a risk of fire and explosion. It can spontaneously ignite when exposed to air. Violent chemical reactions occur in contact with fluorine, chlorine, etc.
Conditions to avoid	exposure to heat, humid air. Forbidden compounds: strong oxidant, oxygen, alkali, halogen.
Incompatible materials	-
Hazardous decomposition products	silicon oxide, hydrogen.

SECTION 11: Toxicological information

Acute toxicity	LC50: 4000ppm (rat inhalation, 4h)
Skin irritation/corrosion	-
Eye irritation/corrosion	-
Respiratory/dermal sensitization	-
Germ cell mutagenicity	-
Carcinogenicity	-
Reproductive toxicity	-
Specific target organ toxicity – single exposure	-
Specific target organ toxicity – repeated exposure	-
Other hazard	-

SECTION 12: Ecological information

Ecotoxicity	-
Persistence and degradability	-
Bioaccumulative potential	according to Kow value predicts that the bioaccumulation of this substance may be weak
Mobility in soil	According to Koc value prediction, this substance may be easy to migrate
Others	-

SECTION 13: Disposal considerations

Waste chemicals	Dispose of them according to the requirements of relevant national and local regulations. Or contact the manufacturer or manufacturer to determine the disposal method.
Waste treatment of containers/ packaging	Return the container to the manufacturer or dispose of it in accordance with national and local regulations.
Disposal precautions	Refer to relevant national and local laws and regulations before disposal.

SECTION 14: Transport information

UN Number	2203
UN shipping name	Silane Hazard class 2.1
Packing group	II Packing labels:
Marine pollutant (Yes/No)	NO
Note	The safety helmet on the cylinder must be worn when transporting it by cylinder. Cylinders are generally laid flat, and the bottle mouths should face the same direction and should not cross; The height shall not exceed the vehicle's fence panel, and use three Corner wood pads clamp firmly to prevent rolling. During transportation, transport vehicles should be equipped with corresponding varieties and quantities of fire-fighting equipment. The exhaust pipe of the vehicle transporting this item must be equipped with a fire retardant device, and it is forbidden to use mechanical equipment and tools that are prone to sparks for loading and unloading. It is strictly forbidden to mix and transport with oxidants, alkalis, halogens, edible chemicals, etc. It should be transported in the morning and evening in summer to prevent sunlight exposure. Stay away from kindling and heat sources during stopovers. When transporting by road, you should follow the prescribed route. It is forbidden to slip away during railway transportation.

SECTION 15: Regulatory information

The following laws, regulations, rules and standards make corresponding provisions for the management of the chemical. Law of the People's Republic of China on the Prevention and Control of Occupational

Diseases	Classification and Catalogue of occupational diseases: Not included
Hazardous chemicals Safety Management Regulations	Hazardous chemicals list: included.
List of explosive hazardous chemicals	Not included. List of hazardous chemicals under key
supervision	Not included. Identification of Major Hazard Sources of Hazardous Chemicals
(Table 1)	Not included Regulations on labor protection in workplaces where toxic substances are used: List of
highly toxic substances	Not included
Regulations on the Administration of Precursor Chemicals	Classification and category
of precursor chemicals	Not included
International conventions	Stockholm Convention: Not included.
Rotterdam Convention	Not included.
Montreal Protocol	Not included.

SECTION 16: Other information

References:

[1] international chemical safety program	international chemical safety CARDS (ICSC), website http://www.ilo.org/dyn/icsc/showcard.home .
[2] International Agency for Research on Cancer, http	http://www.iarc.fr/ . [3] the OECD global chemical information platform, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en .
[4] the CAMEO chemicals database, website	http://cameochemicals.noaa.gov/search/simple .
[5] of the American medical library	chemicals database, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp .
[6] the United States environmental protection agency (epa)	integrated risk information system, website http://cfpub.epa.gov/iris/ .
[7] the U.S. department of transportation	emergency response guidelines, website: http://www.phmsa.dot.gov/hazmat/library/erg .
[8] ESTIS, Germany - Hazardous Substances Database, website	http://gestis-en.itrust.de/ .

Abbreviations and acronyms:

MAC	refers to the concentration of toxic chemicals that should not be exceeded in the workplace, during a working day, at any time.
PC-TWA	refers to the average allowable exposure concentration for 8h working days and 40h working weeks with time as the weight.
PC-STEL	refers to the concentration at which exposure for a short time (15min) is permitted, subject to compliance with PC-TWA.
TLV-C	The limit that cannot be exceeded instantaneously. It is specifically prescribed for certain substances such as irritating gases or substances with acute effects.
TLV-TWA	A time-weighted average concentration of 8 hours per day or 40 hours per week at which repeated lifetime exposure has no adverse effects on almost all workers.
TLV-STEL	is the maximum concentration allowed for continuous exposure of workers for 15 minutes while ensuring compliance with TLV-TWA. This concentration should not exceed 4 times per working day, and the interval between two exposures should be at least 60min. It is a supplement to TLV-TWA.
IARC	International Institute for Research on Cancer RTECS is the Chemical Toxicity database of the National Institute for Occupational Safety and Health
HSDB	The Hazardous Substances Database of the National Library of Medicine
ACGIH	The American Conference of Governmental Industrial Hygienists
Form filling department	Safety and Environmental Protection Department
Data review unit	Production Technology Department
Modification Note	The manual is subject to changes and additions to the relevant data
Other information	None
Disclaimer	The information in this SDS applies only to the specified products and, unless otherwise specified, does not apply to mixtures of this product with other substances. This SDS is intended to provide information on product safety only to appropriately trained users of the product. The user of this SDS shall make an independent judgment as to the suitability of the SDS. The author of this SDS shall not be liable for any injuries resulting from the use of this SDS.