Safety Data Sheet

1、Product and Company information

Item Title:CF4 (TETRAFLUOROMETHANE)
Other names : -
Recommended uses and restrictions on the use: For general analytical / synthetical chemical uses
Manufacturer or vendor name, address and telephone： Jing He Science co., LTD 18F., No.99, Xinpu 6th St., Taoyuan Dist., Taoyuan City 330, Taiwan (R.O.C.) (886) 357-6633
Emergency contact telephone/fax: (886) 357-6633/(886) 357-6616

2、Hazards Identification

Hazard Category： Pressurized gas, specific target organ toxicity.
Mark Content： Symbol: Gas cylinders, exclamation  Warnings：Warning Hazard Warning Information： Contains gas under pressure; may explode if heated. May cause respiratory irritation or may cause drowsiness or dizziness. Precautionary Statements： Wear air respirators, gloves antifreeze. Place container in a well ventilated place. Away from flammable materials. In case of accident or feel unwell, seek medical care immediately. Wear suitable protective clothing, gloves, goggles / face shield.
Other hazards：-

3、Component identification information

Pure substance:

Chinese and English names: CF4 (TETRAFLUOROMETHANE)
Synonyms: Carbon tetrafluoride、Carbon fluoride(CF4)、Carbon fluoride、FC 14、Perfluoromethane、R 14、R 14(refrigerant)、Methane, tetrafluoro-、Freon 14、Tetrafluorocarbon、Halocarbon 14 (airco).
Chemical Abstracts Service Registry Number (CAS No.) : 75-73-0
Hazardous substances Ingredient (percentage): >99%

4、First aid measures

Different exposure pathways, first-aid methods: - Inhalation: If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Be aware of possible explosive atmospheres. Apply artificial respiration if not breathing. Give oxygen if available. For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor. Skin contact: Cold burns: Remove contaminated clothing and gently flush affected areas with warm water (30°C) for 15 minutes . Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention. Eye contact: Cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention. Ingestion: Due to product form and application, ingestion is considered unlikely.
The most important symptoms and hazardous effects: Difficulty breathing, nausea, vomiting, drunkenness, lost sense of direction, choking, irritation, frostbite
Protection of first-aiders: Level C protective equipment should be worn in the security zone first aid
Tips for physicians: Difficulty breathing when given oxygen.

5、Fire Fighting Measures

Suitable Extinguishing Media: Use water fog to cool containers from protected area.
Special hazards that may be encountered when extinguishing a fire: Fire hazard is minimal.
Special fire fighting procedures: Very slight Fire Hazards.
Special protective equipment for fire-fighters and precautions: 1. Safety Move containers from the fire. 2. Water spray to cool fire exposed tanks or containers until the fire is out. 3. Away from the tanks at both ends. 4. Tank safety valve sounded or discoloration due to fire, evacuate immediately. 5. Tank, rail car or tank vehicle transporting the fire, evacuate a radius of 800 meters. 6. For the surrounding fire, use appropriate extinguishing media, water spray to cool fire exposed tanks or containers until the fire is out. 7. In protected areas or spray mist safe distance, but do not spray directly on the chemicals. 8. To lower the vapor mist concentrations. 9. Avoid inhaling chemicals or combustion by-products. 10. People need to stay upwind, away from low-lying. 11. If the chemical spill, consider evacuation personnel downwind.

6、Accidental Release Measures

Personal precautions: Kept clean, wear personal protective equipment, do not directly inhale too much gas.
Environmental precautions: Be well-ventilated
Clean-up methods: If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Use personal protective equipment. Carefully move material to a well ventilated remote area, then allow to discharge. Do not attempt to repair leaking valve or cylinder safety devices.

7、Safe disposal and storage methods

Disposal: Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Do not drag,

drop, slide or roll cylinders. The uncontrolled release of a gas under pressure may cause physical harm. Use a suitable hand truck for cylinder movement.
Storage: Do not store near incompatible materials. Cylinders should be stored below 45°C in a secure area, upright and restrained to prevent cylinders from falling. Cylinders should also be stored in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits.

8、Exposure prevention measures

Engineering controls:-			
Control parameters			
Eight hours day time-weighted average permissible concentration (TWA)	Short period of time when the average allowable centration (STEL)	Maximum allowable concentration (CEILING)	Biological indicators (BEIs)
-	-	-	-
Personal protective equipment: Wear safety boots, leather gloves and safety glasses. Where an inhalation risk exists, wear: self Contained Breathing Apparatus (SCBA) or an Air-line respirator.			
Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.			

9、Physical and chemical properties

Appearance: gas	Odor: odorless
Odor threshold:	Melting point:-187℃
PH:-	Boiling point / boiling range:-128℃
Flammability (solid, gas):-	Flash Point:- Test methods:-
Decomposition temperature: -	
Ignition temperature: -	Explosion limits: -
Vapor Pressure: 106.4KPa@ -127℃	Vapor Density: not available
Density: -	Solubility: 0.0015%
Octanol / water partition coefficient (log Kow):-	Evaporation rate:-

10、Stability and reactivity

Stability: Stable under recommended conditions of storage.
Special Conditions of Hazardous Reaction: Aluminum: exothermic reaction.
Conditions to avoid: Avoid heat, sparks, open flames and other ignition sources.
Materials to avoid: Incompatible with oxidising agents (eg. hypochlorites), alkalis/ alkali earth metals. Compounding ingredients in natural rubber can be extracted during rapid liquid withdrawal and will swell. Also incompatible with aluminium (exothermic reaction).
Hazardous Decomposition Products: -

11、Toxicity data

Routes of exposure: Skin contact, inhalation, ingestion, eye
Symptoms: Inhaled is reduced from 21-14% volume, the pulse rate may accelerate and the rate and volume of breathing may increase. The ability to maintain attention and think clearly is diminished, muscular co-ordination is somewhat disturbed. As oxygen decreases from 14-10% volume, judgement becomes faulty, severe injuries may result in no pain. Muscular effort may lead to rapid fatigue. Further reduction to 6% may result in nausea and vomiting. Ability to move may be lost. Permanent brain damage may result even after resuscitation from exposure to this low level of oxygen. Below 6% breathing is in gasps and convulsions may occur. Inhalation of a mixture containing no oxygen may result in unconsciousness from the first breath and death may follow in minutes.
Acute toxicity:- Inhalation: Asphyxiant. Effects are proportional to oxygen displacement. Skin: Irritating vapour. Direct contact with the liquefied material or escaping compressed gas may cause frost-bite injury. Eyes: Irritant vapour. Low temperature evaporating liquid can cause cold burns. Ingestion: Ingestion is considered unlikely due to product form. However, ingestion may result in discomfort of the gastrointestinal tract from rapid evaporation of liquid and consequent evolution of gas.

Some of the effects of inhalation would be expected.
Chronic toxicity or long-term toxicity: -

12、Ecological data

Biological toxicity: - LC50 (fish): - EC50 (aquatic invertebrates): - Bioconcentration factor (BCF): -
Persistence and degradability:- Half-life (air): - Half-life (water surface): - Half-life (groundwater): - Half-life (soil):
Bioaccumulation: -
Mobility in the soil: -
Other adverse effects: -

13、Waste Disposal Method

Waste Disposal: Cylinders should be returned to the manufacturer or supplier for disposal of contents. Legislation: Dispose of in accordance with relevant local legislation.

14、Transport information

UN number: 1982
UN shipping name: CF4
Transportation hazard classification: 2.2
Packing Group: -
Marine pollutant (yes / no):NO
Special transport methods and precautions: -

15、Regulatory Information

Poison Schedule: A poison schedule number has not been allocated to this product using the criteria in the Standard

for the Uniform Scheduling of Drugs and Poisons (SUSDP). AICS: All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16、Other information

References	1. CHEMINFO database, CCINFO CD,2005-3. 2. HAZARDTEXT database, TOMES PLUS CD, Vol. 65, 2005. 3. RTECS database, TOMES PLUS CD, Vol. 65, 2005. 4. HSDB database, TOMES PLUS CD, Vol. 65, 2005. 5. Against the Chinese database of chemical substances, the EPA. 6. Chem Watch database 2005-2009.	
Watchmaker units	Name: Jing He Science co., LTD	
	Address/Tel: No.21, Dougong 8th Rd., Douliu City, Yunlin County 640, Taiwan (R.O.C.) (886)-5-551-3818 / (886)-5-551-4736	
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Remark	The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders. APPLICATION METHOD: Transferred as a liquid into and out of refrigeration equipment by controlled pressure decanting through flexible pipework. ABBREVIATIONS: ACGIH - American Conference of Industrial Hygienists. ADG - Australian Dangerous Goods. BEI - Biological Exposure Indice(s). CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds. CNS - Central Nervous System. EC No - European Community Number. HSNO - Hazardous Substances and New Organisms. IARC - International Agency for Research on Cancer. mg/m3 - Milligrams per Cubic Metre. NOS - Not Otherwise Specified. pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to	

	14 (highly alkaline). ppm - Parts Per Million. RTECS - Registry of Toxic Effects of Chemical Substances. STEL - Short Term Exposure Limit. SWA - Safe Work Australia. TWA - Time Weighted Average. HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate. PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.