SPECTRA GASES, INC.

HELIUM
Manufacturer MSDS Number: 1013

SECTION I: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS Name: HELIUM

Manufacturer Name: SPECTRA GASES, INC.

General Use:

Various.

Address:

3434 Route 22 West
Branchburg, NJ 08876, U.S.A.

Business Phone: 908/252−9300

Business Fax: 908/252−0811

For information in North America, call: 908/252−9300

For emergencies in the US, call CHEMTREC: 800−424−9300

Manufacturer MSDS Revision Date:

April 2, 1999

Synonyms:

Not Applicable

Chemical Formula: He

:

CHEMICAL NAME : Helium

SPECTRA GASES EMERGENCY CONTACT: 908/454−7455 8:00 am − 5:00 pm

SECTION II: COMPOSITION, INFORMATION ON INGREDIENTS

Chemical Name	***CAS#***		***EINECS #***
Helium	7440597		231−168−5

Other Exposure Guidelines:

There are no exposure limits for Helium; Helium is a simple asphyxiant.

SECTION III: HAZARDS IDENTIFICATION

Emergency Overview:

Helium is a colorless, odorless gas, shipped under pressure. The main health hazard associated with releases of this gas is asphyxiation, by displacement of oxygen.

Applies to All Ingredients:

Potential Health Effects:

ROUTES OF ENTRY, SYMPTOMS OF ACUTE EXPOSURE:
WARNING − If rescue personnel need to enter an area of release of Helium, they should be equipped with Self−Contained Breathing Apparatus (SCBA). High concentration of this gas will create an oxygen−deficient atmosphere, creating the risk of asphyxiation. Acute overexposure to this gas may cause the following health effects:

Eye Contact:

High−pressure gas may result in airborne objects.

Skin Contact:

Not applicable.

Inhalation:

High concentrations of this gas can cause an oxygen−deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. The skin of a victim may have a blue color. Under some circumstances of over−exposure, death may occur, due to the displacement of oxygen. The following effects associated with various levels of oxygen are as follows:

CONCENTRATION of OXYGEN : 20.9% Oxygen
EXPOSURE SYMPTOM : Normal oxygen concentration in air.
CONCENTRATION of OXYGEN : 15−19% Oxygen
EXPOSURE SYMPTOM : Decreased ability to perform tasks. May impair coordination and may induce early symptoms in persons with heart, lung, or circulatory problems.
CONCENTRATION of OXYGEN : 12−15% Oxygen
EXPOSURE SYMPTOM : Breathing increases, especially in exertion. Pulse up. Impaired coordination, perception, and judgment.
CONCENTRATION of OXYGEN : 10−12% Oxygen
EXPOSURE SYMPTOM : Breathing further increases in rate and depth, poor coordination and judgment, lips slightly blue.
CONCENTRATION of OXYGEN : 8−10% Oxygen
EXPOSURE SYMPTOM : Mental failure, fainting, unconsciousness, ashen face, blueness of lips, nausea (upset stomach), and vomiting.
CONCENTRATION of OXYGEN :6−8% Oxygen
EXPOSURE SYMPTOM : 8 minutes, may be fatal in 50−100% of cases; 6 minutes, may be fatal in 25 to 50% of cases; 4−5 minutes, recovery with treatment.
CONCENTRATION of OXYGEN : 4−6% Oxygen
EXPOSURE SYMPTOM : Coma in 40 seconds, followed by convulsion, breathing failure, death.

Ingestion:

Ingestion of this gas is not a likely route of industrial exposure.

Chronic Health Effects:

ROUTE OF ENTRY : Not Applicable
TARGET ORGANS: None.
SYMPTOMS: None.

Carcinogenicity:

Helium is not found on the FEDERAL OSHA Z LIST, NTP, CAL/OSHA, or IARC Carcinogenicity lists and therefore is neither considered to be nor suspected to be a cancer−causing agent by these agencies.

Aggravation of Pre−Existing Conditions:

None are anticipated.

WARNING: Exposure to atmospheres containing 8−10% or less oxygen will bring about unconsciousness without warning and so quickly that individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.
HMIS RATINGS:
HEALTH:=0; FLAMMABILITY:=0; REACTIVITY:=0; PPE: Level B (See section 8, Exposure Controls/Personal Protection)

SECTION IV: FIRST AID MEASURES

Eye Contact:

If mechanical injury occurs, cover eye with bandage and seek appropriate medical attention.

Skin Contact:

Not applicable.

Inhalation:

Remove victim(s) to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio−pulmonary resuscitation, if necessary.

Ingestion:

Ingestion is an unlikely route of exposure for this gas.

Note to Physicians:

Administer oxygen, if necessary, and treat symptoms.

SECTION V: FIRE FIGHTING MEASURES

Fire:

FLAMMABLE RANGE : Not Applicable

Flash Point:

Not Applicable

Auto Ignition Temperature:Not Applicable

Extinguishing Media:

This is a non−flammable, inert gas; use fire−extinguishing media appropriate for the surrounding materials.

Hazardous Combustion Byproducts:

None known.

Fire Fighting Instructions:

Non−flammable, inert gas. Use extinguishing media appropriate for surrounding fire.

Sensitivity to Impact:

Not sensitive.

Static Discharge Effects:

Not sensitive.

NFPA

Health:0

Flammability:0

Reactivity:0

Other: None

Unusual Fire Hazards:

This gas does not burn; however, containers, when involved in fire, may rupture or burst in the heat of the fire. Most cylinders have a pressure release device, which will vent contents if the cylinder is exposed to high temperatures.

SECTION VI: ACCIDENTAL RELEASE MEASURES

Leak Response:

In the event of a leak of this product, operator should close the gas source if possible to do so safely. Evacuate area in the event of a significant release. Only trained personnel, wearing Self−Contained Breathing Apparatus (SCBA) should re−enter a contaminated area if oxygen levels are below 19.5% or unknown.

If leak is in user’s gas handling equipment or system, close cylinder valve, and safely vent high pressure before attempting repairs. If leak is from the cylinder, cylinder valve or the valve pressure relief device (PRD), contact your supplier.

The level of oxygen should above 19.5% before personnel can be allowed in the area

without SCBA.

Detection systems should be available to monitor for level of oxygen.

SECTION VII − HANDLING and STORAGE

Handling:

Releases of Helium can create an oxygen−deficient atmosphere. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Helium could occur without any significant warning symptoms, due to oxygen−deficiency. Wearing contact lenses is not recommended when handling this gas.

Cylinder valves should be inspected regularly for physical damage or corrosion (apparent by discoloration or rust). Care should be taken to inspect the following valve locations for corrosion: neck (where valve inserts into cylinder); bonnet nut (where handle attaches to valve body). Close valve after each use and when empty.

Do not drag, roll, slide or drop cylinder. Use a suitable hand truck designed for cylinder movement. Never attempt to lift a cylinder by its cap. Secure cylinders at all times while in use. Use a pressure regulator to safely discharge product from cylinder. Use a check valve to prevent reverse flow into cylinder. Once cylinder has been connected to properly purged process, open cylinder valve slowly and carefully. If user experiences any difficulty operating cylinder valve, discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, etc.) into valve cap openings; doing so may damage valve, causing a leak to occur. Use an adjustable strap−wrench to remove over−tight or rusted caps.

Do not heat cylinders by any means to increase the discharge rate of product from the cylinder. Never apply flame or localized heat directly to any part of the cylinder. Cylinders should not be artificially cooled as certain types of steel undergo property changes when cryogenically cooled, thus making the cylinder unstable.

Storage:

Cylinders should be stored upright (with valve protection caps or plugs in place) and firmly secured to prevent falling or being knocked over. Cylinders should be stored in dry, well−ventilated areas. Protect from salt or other corrosive materials. Storage should be away from heavily traveled areas, walkways, elevators, platform edges or other objects or situations that could damage the cylinder wall. Do not store in a manner that will block emergency exits, fire extinguishers or other safety equipment. Do not allow storage temperature to exceed 125 deg F (52 deg C). Use a first−in, first−out inventory system to prevent full containers from being stored for long periods of time. Store empty cylinders away from full cylinders. Consideration should be taken to install leak detection and alarm equipment for storage areas. **NOTE :** Use only DOT or ASME code cylinders designed for compressed gas storage. Cylinders must not be recharged except by or with the consent of owner.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT : Follow practices indicated in Section 6 (Accidental Release Measures). Relieve pressure before attempting repairs.

SPECIAL PRECAUTIONS: Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of this gas could occur without any significant warning symptoms. All work operations should be monitored in such a way that emergency personnel can be

immediately contacted in the event of a release. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, Inc. (telephone 703−412−0900) pamphlet CGA P−1, Safe Handling of Compressed Gases in Containers. Local regulations may require specific equipment for storage and use.

SECTION VIII: EXPOSURE CONTROLS, PERSONAL PROTECTION

Ventilation System:

Forced ventilation systems for the general work area should be provided. If appropriate, install automatic monitoring equipment to detect the level of oxygen.

Skin Protection Description:

Work (such as leather) gloves are recommended when handling cylinders of this gas. Wear gloves appropriate to the specific operation for which Helium is used. Use triple gloves for spill response.

Eye/Face Protection:

Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133 or by the European Standard EN166.

Respiratory Protection:

Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen level is below 19.5%, or during emergency response to a release of this product. If respiratory protection is required, follow the requirements of the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent U.S. State standards, standards of Canada, the European Standard EN149, and EC member states.

Other Protective:

Use body protection appropriate for task. Safety shoes are recommended when handling cylinders.

SECTION IX: PHYSICAL AND CHEMICAL PROPERTIES

Physical State/Appearance:

Colorless, odorless gas.

Boiling Point:

@ 1 atm : −268.9 deg C (−452.1 deg F)

Freezing Point:

@ 1 atm : None.

Solubility:

SOLUBILITY IN WATER vol/vol at 0 deg C (32 deg F) and 1 atm : 0.094

Specific Gravity:

(air = 1) @ 21.1 deg C (70 deg F) : 1.38

Molecular Weight:

4.00

Odor Threshold:

Helium is odorless.

Coefficient of Water/Oil Distribution:

Not applicable.

Specific Volume:

@ 21.1 deg C (70 deg F): 97.09 lb./ft3 (6.061 m3/kg)

GAS DENSITY @ 21.1 deg C (70 deg F): 0.0103 lb./ft3 (0.165 kg/m3)

CRITICAL PRESSURE : 33.0 psia (227 kPa abs)

WARNING PROPERTIES FOR THIS GAS : There are no warning properties in the event of a release. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

SECTION X: STABILITY AND REACTIVITY

Chemical Stability:

Stable.

Conditions to Avoid:

Cylinders should not be exposed to temperatures in excess of 125 deg F (52 deg C).

Incompatibilities with Other Materials:

None. Helium is an inert gas.

Hazardous Polymerization:

Will not occur.

Hazardous Decomposition Products:

None.

SECTION XI: TOXICOLOGICAL INFORMATION

Applies to All Ingredients:

Carcinogenicity:

Helium has not been found to be carcinogenic.

Mutagenicity:

Helium has not been found to cause mutagenic effects in humans.
A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines.

Teratogenicity:

Helium has not been found to cause teratogenic effects in humans.
A teratogen is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines.

Embryo Toxicity:

Helium has not been found to cause embryotoxic effects in humans.
An embryotoxin is a chemical that causes damage to a developing embryo (i.e., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines.

Sensitization:

Helium is not a sensitizer.

Reproductive Toxicity:

Helium has not been found to cause adverse reproductive effects in humans.
A reproductive toxin is any substance that interferes in any way with the reproductive process.

Irritation:

Not applicable.

Toxicological Paragraph:

TOXICITY DATA : There are no specific toxicology data for Helium. Helium is a simple asphyxiant, which acts to displace oxygen in the environment.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for Helium.

SECTION XII: ECOLOGICAL INFORMATION

Bioaccumulation:Helium will not bioaccumulate.

Effect of Material on Plants/Animals:

Any adverse effect on plants would be related to oxygen−deficient environments or frost from rapidly expanding gases.

Effect of Material On Aquatic Life:

There is currently no evidence of adverse effects from exposure to Helium on aquatic life.

Environmental Stability:

Helium occurs naturally in the atmosphere. The gas will be dissipated rapidly in well−ventilated areas.

MOBILITY : Helium is inert and does not present a hazard of mobility.

PERSISTENCE AND BIODEGRADABILITY: Persistence: Helium is a natural element and presents no hazard of persistence. Biodegradation: Helium is fully biodegradable.

OZONE−DEPLETION POTENTIAL : Helium is not a Class I or Class II ozone depleting chemical (40 CFR Part 82).

SECTION XIII: DISPOSAL CONSIDERATIONS

Waste Disposal:

Residual product may be safely released in a well−ventilated area. This shall be done in accordance with U.S. Federal, State and local regulations, regulations of the provinces of Canada or EC member states.

UNUSED PRODUCT / EMPTY CONTAINER: Do not dispose of unused product. Return used product in cylinders to: Spectra Gases, Inc., 80 Industrial Drive, Alpha, NJ 08865 or Spectra Gases, Inc., 1261 Activity Drive, Vista, CA 92083.

SECTION XIV: TRANSPORT INFORMATION

DOT Shipping Name:

Helium, compressed

DOT Hazard Class:2.2 (Non−Flammable Gas)

DOT Identification Number:UN 1046

DOT Subpart E Labeling Requirement:Non−Flammable Gas

IMO:

IMO DESIGNATION: This gas is considered as dangerous goods, per the International Maritime Organization.

HAZARD LABEL(S) REQUIRED :Not Applicable
IMDG CODE : Page 2144
MARINE POLLUTANT : Helium is not designated by the IMO to be a Marine Pollutant.

IMO Shipping Name:

Helium, compressed

IMO Hazard Class:

2.2 (Non−Flammable Gas)

IMO UN Number:UN 1046

IATA:

IATA DESIGNATION : This gas is considered as dangerous goods, per the International Air Transport Association.

HAZARD LABEL(S) REQUIRED :Not Applicable

The following Packaging Information is applicable to this product:
PASSENGER AND CARGO AIRCRAFT :
Packing Instruction : 200
Max. Qty per Pkg : 75 kg
CARGO AIRCRAFT ONLY :
Packing Instruction : 200
Max. Qty per Pkg : 150 kg

IATA Shipping Name:

Helium, compressed

IATA Hazard Class:

2.2 (Non−Flammable Gas)

IATA UN Number:UN 1046

RID/ADR:EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR) : This gas is considered by the Economic Commission for Europe to be dangerous goods. Additional information is as follows:
SUBSTANCE IDENTIFICATION NO.: 1046
LABEL : 2

RID/ADR Shipping Name:

Helium, compressed

RID/ADR Item Number:2, 1°A

RID/ADR Hazard ID Number:20

Special Shipping Information:

Cylinders should be transported in a secure position in a well−ventilated truck (never transport in passenger compartment of a vehicle). Ensure cylinder valve is properly closed, valve outlet cap has been reinstalled, and valve protection cap is secured before shipping cylinder.
CAUTION: Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner's written consent is a violation of Federal law (49 CFR 173.301).

DOT :

PLACARD (When required): Not Applicable

NAERG (NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK) #: 121

CANADIAN SHIPPING INFORMATION:
TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS :
This gas is considered as dangerous goods; use the above information for the preparation of Canadian Shipments.

SECTION XV: REGULATORY INFORMATION

Applies to all ingredients:

TSCA 8(b): Inventory Status

Toxic Substances Control Act : Helium is listed on the TSCA Inventory

SARA:

SARA TITLE III : Superfund Amendment and Reauthorization Act

Section 302:

Emergency Planning and Notification (40 CFR Part 355) Extremely Hazardous Substances :
Helium is not listed.

Section 302 Extremely Hazardous Substances (TPQ):Not Applicable

Section 302 Extremely Hazardous Substances (RQ):Not Applicable

Section 304:

CERCLA : Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (40 CFR Parts 117 and 302)

Section 304 CERCLA RQ:Not Applicable

Section 312 Hazard Category:

Hazardous Chemical Reporting (40 CFR Part 370)

Acute:No

Chronic:No

Fire:No

Reactive:No

Pressure:Yes

Section 313 Toxic Release Form:

Toxic Chemical Release Reporting (40 CFR 372)
Releases of Helium do not require reporting under Section 313.

Section 112(r): Clean Air Act

Risk Management Programs for Chemical Accidental Release (40 CFR Part 68)

Clean Air Act TPQ:Not Applicable

OSHA 29 CFR 1200:

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION :
29 CFR Part 1910.119 : Process Safety Management of Highly Hazardous Chemicals.
Threshold Planning Quantity (TPQ): Not Applicable

State:

CALIFORNIA PROPOSITION 65: Helium is not a listed substance which the State of California requires warning under this statute.

The components of this gas mixture are covered under the following specific State regulations (more specific regulations exist in some States):

Alaska − Designated Toxic and Hazardous Substances : Helium.
California − Permissible Exposure Limits for Chemical Contaminants : Helium.
Florida − Substance List: Helium.
Illinois − Toxic Substance List: Helium.
Kansas − Section 302/313 List:. No.
Massachusetts − Substance List: Helium.
Michigan − Critical Materials Register: Helium.
Minnesota − List of Hazardous Substances: Helium.
Missouri − Employer Information/Toxic Substance List: Helium.
Massachusetts − Substance List: Helium.
New Jersey − Right to Know Hazardous Substance List: Helium.
North Dakota − List of Hazardous Chemicals, Reportable Quantities: No.
Pennsylvania − Hazardous Substance List: Helium.
Rhode Island − Hazardous Substance List: Helium.
Texas − Hazardous Substance List: No.
West Virginia − Hazardous Substance List: No.
Wisconsin − Toxic and Hazardous Substances: No.

European Community Chemical Inventory Status:

EC LABELING AND CLASSIFICATION : Helium does not meet the definition of any hazard class as defined by the European Community Council Directive 67/548/EEC. Additionally, an official classification for this substance has not been published in Commission Directives 93/72/EEC, 94/69 EC, or and 96/54/EC.
EC CLASSIFICATION: Not applicable.
EC RISK PHRASES: Not applicable.
EC SAFETY PHRASES: Not applicable.
EUROPEAN COMMUNITY ANNEX II HAZARD SYMBOL : Not applicable.

CANADIAN FEDERAL REGULATIONS:
CANADIAN DSL INVENTORY STATUS: Helium is listed on the Canadian DSL Inventory.
OTHER CANADIAN REGULATIONS: Helium is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations. Helium is not on the CEPA Priorities Substances Lists.

SECTION XVI: ADDITIONAL INFORMATION

MSDS Author:

CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive
San Diego, CA 92123−1002
619/565−0302

Disclaimer:

Information contained in this Material Safety Data Sheet is provided to our customers so they may comply with 29 CFR 1910.1200, Hazard Communication Standard, the Canadian WHMIS Standard, and the requirements of the European Community Directives. The intent of this Material Safety Data Sheet is to provide end users of this product with the health and physical hazards associated with possible exposure to this product. All statements, technical data and recommendations are based on readily available texts and data that Spectra Gases, Inc., believes to be reliable and accurate. Spectra Gases, Inc., makes no warranties, guarantees or representations of any kind with respect to this product or this data. It is the responsibility of the user to obtain and use the most recent version of this MSDS.

Further information about compressed gases can be found in the following pamphlets published by:
Compressed Gas Association Inc. (CGA)
1725 Jefferson Davis Highway, Suite 1004
Arlington, VA 22202−4102
Telephone: (703) 412−0900.

P−1 “Safe Handling of Compressed Gases in Containers”
AV−1 “Safe Handling and Storage of Compressed Gases” “Handbook of Compressed Gases”