Material Safety Data Sheet

Date Printed: 13/DEC/2004
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Version 1.2
According to 91/155/EEC

1 - Product and Company Information

Product Name	NITROUS OXIDE, PRESSURE TIN WITH 1 L
Product Number	00583
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
NITROUS OXIDE	10024-97-2	233-032-0	None

Formula	N2O
Molecular Weight	44.01 AMU
Synonyms	Dinitrogen monoxide * Factitious air * Hyponitrous acid anhydride * Laughing gas * Nitrous oxide (ACGIH:OSHA)

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
Contact with combustible material may cause fire.

4 - First Aid Measures

AFTER INHALATION
If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

AFTER SKIN CONTACT
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

AFTER EYE CONTACT
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA
Suitable: Carbon dioxide, dry chemical powder, or appropriate

foam.

SPECIAL RISKS
Specific Hazard(s): Emits toxic fumes under fire conditions. Contact with other material may cause fire. May accelerate combustion.
Explosion Hazards: Container explosion may occur under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING
Directions for Safe Handling: Do not breathe gas. Do not get in eyes, on skin, on clothing.

STORAGE
Conditions of Storage: Keep tightly closed. Keep away from combustible materials, heat, sparks, and open flame. Cylinder temperature should not exceed 125˚F (52˚C).

SPECIAL REQUIREMENTS: Contents under pressure.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS
Use only in a chemical fume hood. Safety shower and eye bath.

WORK PRACTICES
Store and use with adequate ventilation.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling. Remove and wash contaminated clothing promptly.

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	90 mg/m3
		50 ppm

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	180 mg/m3
		100 ppm

Remarks: 4

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	90 mg/m3
		50 ppm

Remarks: R

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level	180 mg/m3
		100 ppm

Remarks: H

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	182 mg/m3
		100 ppm

Remarks: D

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	183 mg/m3
		100 ppm

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance: Physical State: Gas

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	-88 ˚C	760 mmHg
MP/MP Range	-91 ˚C	
Flash Point	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	51.7 mmHg	21 ˚C
SG/Density	N/A	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	1.53 g/l	15 ˚C
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Aluminum, Boron oxides, Hydrazine, Strong reducing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Nature of decomposition products not known.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: QX1350000

SIGNS AND SYMPTOMS OF EXPOSURE
When nitrous oxide is inhaled in high concentrations for only a few seconds, it affects the central nervous system and may induce symptoms of intoxication. Nitrous oxide is known to cause anemia in humans who are repeatedly overexposed. Subtle effects on the central nervous system (CNS) have been reported in man at concentrations of 50 to 500 ppm. Epidemiological evidence exists that indicates nitrous oxide may cause embryofetal toxicity in humans resulting in spontaneous abortions.

ROUTE OF EXPOSURE
Skin Contact: May cause skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: May cause eye irritation.
Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract. Can cause rapid suffocation.
Ingestion: May be harmful if swallowed.

TARGET ORGAN INFORMATION
Blood. Lungs.

CHRONIC EXPOSURE - CARCINOGEN
Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

CHRONIC EXPOSURE - MUTAGEN

Human
50 PPH/24H
Inhalation
DNA inhibition

Rat
75000 PPM
Inhalation
24H
DNA inhibition

Rat
50 PPH/24H (10-11D PREG)
Inhalation
Other mutation test systems

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 50 PPH/24H
Route of Application: Inhalation
Exposure Time: (8-11D PREG)
Result: Specific Developmental Abnormalities: Central nervous system. Specific Developmental Abnormalities: Cardiovascular (circulatory) system. Specific Developmental Abnormalities: Urogenital system.

Species: Rat
Dose: 1 PPH/8H
Route of Application: Inhalation
Exposure Time: (1-21D PREG)
Result: Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Effects on Embryo or Fetus: Fetal death.

Species: Rat
Dose: 3 GM/KG
Route of Application: Subcutaneous
Exposure Time: (8D PREG)
Result: Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

Species: Mouse
Dose: 75 PPH/6H
Route of Application: Inhalation
Exposure Time: (14D PREG)
Result: Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material).

Species: Hamster
Dose: 95 PPH/24H
Route of Application: Inhalation
Exposure Time: (7D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD
Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Species: Rat
Dose: 5 PPH/4H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Effects on Newborn: Behavioral.

Species: Rat
Dose: 20 PPH/8H
Route of Application: Inhalation
Exposure Time: (28D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Rat
Dose: 50 PPM/6H
Route of Application: Inhalation
Exposure Time: (30D MALE)
Result: Effects on Newborn: Live birth index (# fetuses per litter; measured after birth). Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Rat
Dose: 50 PPH/4H
Route of Application: Inhalation
Exposure Time: (14D PREG)
Result: Effects on Newborn: Biochemical and metabolic.

Species: Rat
Dose: 3 GM/KG
Route of Application: Subcutaneous
Exposure Time: (8D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Other effects to embryo. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 5000 PPM/4H
Route of Application: Inhalation
Exposure Time: (14D PREG)
Result: Effects on Newborn: Behavioral.

Species: Hamster
Dose: 90 PPH/24H
Route of Application: Inhalation
Exposure Time: (10D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

12 - Ecological Information

No data available.

13 - Disposal Considerations

SUBSTANCE DISPOSAL
Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.

CONTAMINATED CONTAINER DISPOSAL
Caution: no-return cylinder. Do not reuse. Empty cylinder will contain hazardous residue. Follow proper disposal techniques.

14 - Transport Information

RID/ADR
UN#: 1070
Class: 2
Proper Shipping Name: Nitrous oxide

IMDG
UN#: 1070
Class: 2.2
Subrisk: 5.1
Proper Shipping Name: Nitrous oxide
Marine Pollutant: No
Severe Marine Pollutant: No

IATA
UN#: 1070
Class: 2.2
Subrisk: 5.1

Proper Shipping Name: Nitrous oxide
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
INDICATION OF DANGER: O
Oxidizing.
R-PHRASES: 8
Contact with combustible material may cause fire.
S-PHRASES: 38
In case of insufficient ventilation, wear suitable respiratory equipment.

COUNTRY SPECIFIC INFORMATION

Germany
WGK: 1

16 - Other Information

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

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