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

Catalogue Number	CS-ET-00229
Product Name	Ethylene Oxide Solution R2
CAS No.	75-21-8
Category	BP Standard
Synonyms	Ethylene oxide
Brand	Clearsynth Labs Ltd.
Identified uses	Laboratory Chemicals
Uses advised against	Not available
Company	Clearsynth Labs Ltd. Mumbai, India
Emergency Phone #	+91-22-245045900
REACH No.	Not available

SECTION 2: Hazards identification

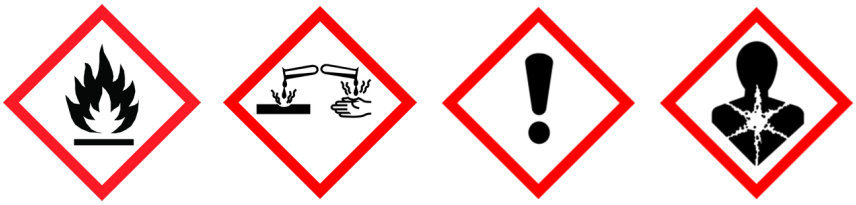
Disclaimer: This is sample MSDS. Please email **sales@clearsynth.com** for more details.

2.1 Classification of the substance or mixture-Regulation (EC) No 1272/2008:

Skin irritation (Category 2)
Serious eye damage/eye irritation (Category 2)
Acute toxicity (Category 4)

2.2 Label Elements

Signal Word: Warning



Hazard Statement(s)

Code	Statement
H220	Not available
H301	Not available

H314	Not available
H318	Causes serious eye damage.
H331	Not available
H335	Not available
H336	Not available
H340	Not available
H350	Not available
H372	Not available
H230	Not available
H280	Not available
H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H360	Not available
H317	May cause an allergic skin reaction.
H411	Toxic to aquatic life with long lasting effects.
H412	Not available
H370	Not available
H373	Not available
H402	Not available

Precautionary Statement(s)

Code	Statement
P203	Not available
P210	Not available
P222	Not available
P260	Not available
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P264	Wash hands thoroughly after handling.
P264+P265	Not available

P270	Not available
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P316	Not available
P301+P330+P331	Not available
P302+P361+P354	Not available
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P354+P338	Not available
P316	Not available
P317	Not available
P318	Not available
P319	Get medical help if you feel unwell.
P321	Specific treatment (see … on this label).
P330	Not available
P363	Not available
P377	Not available
P381	Not available
P403	Not available
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local/regional/national/international regulatio
P301+P317	Not available
P302+P352	IF ON SKIN: Wash with plenty of water and soap.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if presen
P332+P317	If skin irritation occurs: Get medical help.
P337	Not available
P337+P317	If eye irritation persists: Get medical help.
P362+P364	Take off contaminated clothing and wash it before reuse.
P410+P403	Not available
P272	Not available

P273	Not available
P333+P317	Not available
P391	Not available
P308+P316	Not available

SECTION 3: Composition / information on ingredients

3.1 Substance

Component : Ethylene Oxide Solution R2
CAS Number : 75-21-8
Molecular Formula : C2H4O
Molecular Weight : 44.05
Parent Chemical : -
Synonyms : Ethylene oxide
Concentration : Not available

SECTION 4: First aid measures

SECTION 4: First-aid measures

4.1 Description of first aid measures
General advice: Remove from exposure. Show this safety data sheet to the doctor in attendance.
Inhalation: Move person to fresh air. Keep at rest. If breathing is difficult, seek medical attention.
Skin contact: Remove contaminated clothing and shoes. Rinse skin with plenty of water. Seek medical attention if irritation or symptoms occur.
Eye contact: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Seek medical attention.
Ingestion: Rinse mouth. Do NOT induce vomiting. Seek medical attention.

4.2 Most important symptoms and effects, both acute and delayed
Not available.

4.3 Indication of any immediate medical attention and special treatment needed
Treat symptomatically. Not available.

SECTION 5: Firefighting measures

SECTION 5: Fire-fighting measures

5.1 Extinguishing media
Suitable extinguishing media: Not available.
Unsuitable extinguishing media: Not available.

5.2 Special hazards arising from the substance or mixture
Not available.

5.3 Advice for firefighters

Wear self-contained breathing apparatus (SCBA) and full protective gear. Cool containers with water spray if exposed to fire. Prevent fire-fighting water from entering drains or waterways. Not available.

SECTION 6: Accidental release measures

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Evacuate unnecessary personnel. Ensure adequate ventilation. Avoid breathing vapors/mist. Avoid contact with skin and eyes. Use appropriate personal protective equipment.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Prevent entry into drains, sewers, or waterways.

6.3 Methods and material for containment and cleaning up
Contain spill. Absorb with inert absorbent material. Collect in suitable, labeled containers for disposal. Clean contaminated area. Not available.

6.4 Reference to other sections
See Section 8 for personal protective equipment and Section 13 for disposal considerations.

SECTION-7: Handling and storage

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Handle in accordance with good industrial hygiene and safety practice. Use only with adequate ventilation. Avoid breathing vapors/mist. Avoid contact with skin, eyes, and clothing. Keep away from heat, sparks, open flames, and hot surfaces. No smoking.

7.2 Conditions for safe storage, including any incompatibilities
Store in a cool, well-ventilated place. Keep container tightly closed. Protect from heat and direct sunlight. Store away from incompatible materials. Incompatible materials: Not available.

7.3 Specific end use(s)
Not available.

SECTION 8: Exposure controls / personal protection

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Occupational exposure limits: Not available.
Biological limit values: Not available.

8.2 Exposure controls
Engineering controls: Provide adequate ventilation. Use local exhaust where appropriate.
Personal protective equipment (PPE):
- Eye/face protection: Safety glasses with side shields or chemical splash goggles.
- Skin protection: Chemical-resistant gloves; protective clothing as appropriate.
- Respiratory protection: Use appropriate respirator if ventilation is inadequate or exposure limits may be exceeded.
Not available.

- Hygiene measures: Wash hands thoroughly after handling. Remove contaminated clothing and wash before reuse.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Test	Result
Appearance	No data available
IR spectrum	No data available
pH	No data available
Solubility	No data available

Property	Value
a) Physical State	No data available
b) Color	No data available
c) Odor	No data available
d) pH	No data available
e) Vapour Pressure	No data available
f) Viscosity	No data available
g) Initial Boiling Point and boiling range	No data available
h) Melting Point / Freezing Point	No data available
i) Auto Ignition Temperature	No data available
j) Flash Point	No data available
k) Explosion Limit, Lower	No data available
l) Explosion Limit, Upper	No data available
m) Decomposition Temperature	No data available
n) Loss on Drying	No data available
o) Relative Density	No data available
p) Solubility (in DMSO)	No data available
q) Oxidizing Properties	No data available

SECTION 10: Stability and reactivity

SECTION 10: Stability and reactivity

10.1 Reactivity
Not available.

10.2 Chemical stability
Not available.

10.3 Possibility of hazardous reactions
Not available.

10.4 Conditions to avoid
Heat, sparks, open flames, and other ignition sources. Not available.

10.5 Incompatible materials
Not available.

10.6 Hazardous decomposition products
Not available.

SECTION 11: Toxicological information

11.1 Information on toxicological effects
- Acute toxicity: IDENTIFICATION: Ethylene oxide is a colorless, high reactive gas at room temperature and pressure. It used in the manufacture of ethylene glycol and surfactants. It used in the manufacture of surfactants. Ethylene oxide is also used as a sterilant for health care materials and other heat-sensitive products. HUMAN EXPOSURE: Ethylene oxide is rapidly taken up via the lungs, distributed, and metabolized to ethylene glycol and to glutathione conjugates. Ethylene oxide can be absorbed though the skin from the gas phase or from aqueous solutions and is uniformly distributed throughout the body. Ethylene oxide is an alkylating agent and forms protein and DNA adducts. Hemoglobin adducts have been used for biomonitoring. Based on studies primarily in occupationally exposed populations, ethylene oxide is an ocular, respiratory, and dermal irritant and a sensitizing agent. Neurological effects (primarily sensorimotor polyneuropathy) have been observed in workers exposed to relatively high concentrations. The route of likely greatest exposure and focus of the human health is inhalation from air. There is some evidence of an association between exposure to ethylene oxide and the development of haematological cancers in epidemiological studies of occupationally exposed populations, limitations of the data preclude definitive conclusions. There is consistent evidence that ethylene oxide has induced clastogenic changes in exposed workers. ANIMAL/PLANT STUDIES: The acute inhalation toxicity of ethylene oxide in rodents and dogs is low. In inhalation studies, ethylene oxide has induced a wide range of tumours (e.g., leukaemia, lymohoma, brain, lung). Ethylene oxide induces gene mutations at all phylogenetic levels tested in vitro and in vivo. It also induces germ cell mutations and clastogenic effects in experimental animals. In experimental animals, ethylene oxide is fetotoxic in the presence and absence of maternal toxicity at concentrations higher than those associated with cancer and other non-cancer (i.e., neurological) effects; it is teratogenic only at very high concentrations (above about 1600 mg/m3). Evidence from epidemiological studies of reproductive effects (primarily spontaneous abortions) of ethylene oxide in humans is limited. In experimental animals, among non-neoplastic effects, reproductive effects occur at lowest concentration (>90 mg/m3). These include reductions in litter size, increased post-implantation losses, alterations in sperm morphology, and changes in sperm count and motility. Available data on the non-neoplastic effects of repeated exposure to ethylene oxide in studies are limited, with past focus being primarily on the carcinogenicity of the compound. Reported effects in studies in animals were restricted primarily to those on

the hematological and nervous systems. The major effects seen in workers exposed to ethylene oxide at low levels for several months or years are irritation of the eyes, skin, and mucous membranes and problems in the functioning of the brain and nerves. Acute exposure leads to central nervous system effects. Headache, nausea and vomiting are often evident. Peripheral neuropathy, impaired hand-eye coordination and memory loss have been reported in more recent case studies of chronically-exposed workers at estimated average exposure levels as low as 3 ppm. Ethylene oxide easily penetrates through the clothing and footwear, causing skin irritation and dermatitis with the formation of blisters, fever and leukocytosis. High concentrations can cause pulmonary edema and damage the cardiovascular system.
- Skin corrosion/irritation: The major effects seen in workers exposed to ethylene oxide at low levels for several months or years are irritation of the eyes, skin, and mucous membranes and problems in the functioning of the brain and nerves. Acute exposure leads to central nervous system effects. Headache, nausea and vomiting are often evident. Peripheral neuropathy, impaired hand-eye coordination and memory loss have been reported in more recent case studies of chronically-exposed workers at estimated average exposure levels as low as 3 ppm. Ethylene oxide easily penetrates through the clothing and footwear, causing skin irritation and dermatitis with the formation of blisters, fever and leukocytosis. High concentrations can cause pulmonary edema and damage the cardiovascular system.
- Serious eye damage/eye irritation: Exposure to high concentrations of ethylene oxide vapor or eye splashes of concentrated solutions can cause eye irritation, inflammation of the eye membrane and corneal injury. Exposure to ethylene oxide has also been linked to the development of cataracts. IDENTIFICATION: Ethylene oxide is a colorless, high reactive gas at room temperature and pressure. It used in the manufacture of ethylene glycol and surfactants. It used in the manufacture of surfactants. Ethylene oxide is also used as a sterilant for health care materials and other heat-sensitive products. HUMAN EXPOSURE: Ethylene oxide is rapidly taken up via the lungs, distributed, and metabolized to ethylene glycol and to glutathione conjugates. Ethylene oxide can be absorbed though the skin from the gas phase or from aqueous solutions and is uniformly distributed throughout the body. Ethylene oxide is an alkylating agent and forms protein and DNA adducts. Hemoglobin adducts have been used for biomonitoring. Based on studies primarily in occupationally exposed populations, ethylene oxide is an ocular, respiratory, and dermal irritant and a sensitizing agent. Neurological effects (primarily sensorimotor polyneuropathy) have been observed in workers exposed to relatively high concentrations. The route of likely greatest exposure and focus of the human health is inhalation from air. There is some evidence of an association between exposure to ethylene oxide and the development of haematological cancers in epidemiological studies of occupationally exposed populations, limitations of the data preclude definitive conclusions. There is consistent evidence that ethylene oxide has induced clastogenic changes in exposed workers. ANIMAL/PLANT STUDIES: The acute inhalation toxicity of ethylene oxide in rodents and dogs is low. In inhalation studies, ethylene oxide has induced a wide range of tumours (e.g., leukaemia, lymohoma, brain, lung). Ethylene oxide induces gene mutations at all phylogenetic levels tested in vitro and in vivo. It also induces germ cell mutations and clastogenic effects in experimental animals. In experimental animals, ethylene oxide is fetotoxic in the presence and absence of maternal toxicity at concentrations higher than those associated with cancer and other non-cancer (i.e., neurological) effects; it is teratogenic only at very high concentrations (above about 1600 mg/m3). Evidence from epidemiological studies of reproductive effects (primarily spontaneous abortions) of ethylene oxide in humans is limited. In experimental animals, among non-neoplastic effects, reproductive effects occur at lowest concentration (>90 mg/m3). These include reductions in litter size, increased post-implantation losses, alterations in sperm morphology, and changes in sperm count and motility. Available data on the non-neoplastic effects of repeated exposure to ethylene oxide in studies are limited, with past focus being primarily on the carcinogenicity of the compound. Reported effects in studies in animals were restricted primarily to those on the hematological and nervous systems.
- Respiratory or skin sensitization: No data available.

- Germ cell mutagenicity: Evaluation: There is limited evidence in humans for the carcinogenicity of ethylene oxide. There is sufficient evidence in experimental animals for the carcinogenicity of ethylene oxide. In making the overall evaluation, the Working Group took into consideration the following supporting evidence. Ethylene oxide is a directly acting alkylating agent that: (1) induces a sensitive, persistent dose-related increase in the frequency of chromosomal aberrations and sister chromatid exchange in peripheral lymphocytes and micronuclei in bone marrow cells of exposed workers; (2) has been associated with malignancies of the lymphatic and hematopoietic system in both humans and experimental animals; (3) induces a dose related increase in the frequency of hemoglobin adducts in exposed humans and dose related increases in the numbers of adducts in DNA and hemoglobin in exposed rodents; (4) induces gene mutations and heritable translocations in germ cells of exposed rodents; and (5) is a powerful mutagen and clastogen at all phylogenetic levels. Overall evaluation: Ethylene oxide is carcinogenic to humans (Group 1). At high doses (>200 ppm) ethylene oxide irritates mucous membranes of the nose and throat; higher concentrations cause damage to the trachea and bronchi, progressing into the partial collapse of the lungs. High concentrations can cause pulmonary edema and damage the cardiovascular system. Because the odor threshold for ethylene oxide varies between 250 and 700 ppm, the gas will already be at toxic concentrations when it can be smelled. Ethylene oxide is carcinogenic, mutagenic and an irritant. With chronic low doses, an increased incidence of brain tumors and mononuclear cell leukemia was found in rats that had inhaled ethylene oxide at concentrations of 10, 33, or 100 mL/m3 over a period of two years. Studies of workers exposed to ethylene oxide in ethylene oxide factories or hospital sterilizing rooms have shown an increased incidence of leukemia, stomach cancer, cancer of the pancreas and Hodgkin's disease.
- Carcinogenicity: IDENTIFICATION: Ethylene oxide is a colorless, high reactive gas at room temperature and pressure. It used in the manufacture of ethylene glycol and surfactants. It used in the manufacture of surfactants. Ethylene oxide is also used as a sterilant for health care materials and other heat-sensitive products. HUMAN EXPOSURE: Ethylene oxide is rapidly taken up via the lungs, distributed, and metabolized to ethylene glycol and to glutathione conjugates. Ethylene oxide can be absorbed though the skin from the gas phase or from aqueous solutions and is uniformly distributed throughout the body. Ethylene oxide is an alkylating agent and forms protein and DNA adducts. Hemoglobin adducts have been used for biomonitoring. Based on studies primarily in occupationally exposed populations, ethylene oxide is an ocular, respiratory, and dermal irritant and a sensitizing agent. Neurological effects (primarily sensorimotor polyneuropathy) have been observed in workers exposed to relatively high concentrations. The route of likely greatest exposure and focus of the human health is inhalation from air. There is some evidence of an association between exposure to ethylene oxide and the development of haematological cancers in epidemiological studies of occupationally exposed populations, limitations of the data preclude definitive conclusions. There is consistent evidence that ethylene oxide has induced clastogenic changes in exposed workers. ANIMAL/PLANT STUDIES: The acute inhalation toxicity of ethylene oxide in rodents and dogs is low. In inhalation studies, ethylene oxide has induced a wide range of tumours (e.g., leukaemia, lymohoma, brain, lung). Ethylene oxide induces gene mutations at all phylogenetic levels tested in vitro and in vivo. It also induces germ cell mutations and clastogenic effects in experimental animals. In experimental animals, ethylene oxide is fetotoxic in the presence and absence of maternal toxicity at concentrations higher than those associated with cancer and other non-cancer (i.e., neurological) effects; it is teratogenic only at very high concentrations (above about 1600 mg/m3). Evidence from epidemiological studies of reproductive effects (primarily spontaneous abortions) of ethylene oxide in humans is limited. In experimental animals, among non-neoplastic effects, reproductive effects occur at lowest concentration (>90 mg/m3). These include reductions in litter size, increased post-implantation losses, alterations in sperm morphology, and changes in sperm count and motility. Available data on the non-neoplastic effects of repeated exposure to ethylene oxide in studies are limited, with past focus being primarily on the carcinogenicity of the compound. Reported effects in studies in animals were restricted primarily to those on the hematological and nervous systems. Ethylene oxide is an alkylating agent. The addition of alkyl groups to proteins, DNA, and RNA by binding to the sulfhydryl and hydroxyl, amino, and carboxyl groups, prevents normal

cellular metabolism and ultimately kills cells. It is likely that the carcinogenicity of ethylene oxide in laboratory animals arises primarily as a result of its direct alkylation of DNA and RNA. In vivo exposure to ethylene oxide induced mutations (5- to 5.6-fold) at the Hprt locus in splenic T-lymphocytes in rats and mice.
- Reproductive toxicity: IDENTIFICATION: Ethylene oxide is a colorless, high reactive gas at room temperature and pressure. It used in the manufacture of ethylene glycol and surfactants. It used in the manufacture of surfactants. Ethylene oxide is also used as a sterilant for health care materials and other heat-sensitive products. HUMAN EXPOSURE: Ethylene oxide is rapidly taken up via the lungs, distributed, and metabolized to ethylene glycol and to glutathione conjugates. Ethylene oxide can be absorbed though the skin from the gas phase or from aqueous solutions and is uniformly distributed throughout the body. Ethylene oxide is an alkylating agent and forms protein and DNA adducts. Hemoglobin adducts have been used for biomonitoring. Based on studies primarily in occupationally exposed populations, ethylene oxide is an ocular, respiratory, and dermal irritant and a sensitizing agent. Neurological effects (primarily sensorimotor polyneuropathy) have been observed in workers exposed to relatively high concentrations. The route of likely greatest exposure and focus of the human health is inhalation from air. There is some evidence of an association between exposure to ethylene oxide and the development of haematological cancers in epidemiological studies of occupationally exposed populations, limitations of the data preclude definitive conclusions. There is consistent evidence that ethylene oxide has induced clastogenic changes in exposed workers. ANIMAL/PLANT STUDIES: The acute inhalation toxicity of ethylene oxide in rodents and dogs is low. In inhalation studies, ethylene oxide has induced a wide range of tumours (e.g., leukaemia, lymohoma, brain, lung). Ethylene oxide induces gene mutations at all phylogenetic levels tested in vitro and in vivo. It also induces germ cell mutations and clastogenic effects in experimental animals. In experimental animals, ethylene oxide is fetotoxic in the presence and absence of maternal toxicity at concentrations higher than those associated with cancer and other non-cancer (i.e., neurological) effects; it is teratogenic only at very high concentrations (above about 1600 mg/m3). Evidence from epidemiological studies of reproductive effects (primarily spontaneous abortions) of ethylene oxide in humans is limited. In experimental animals, among non-neoplastic effects, reproductive effects occur at lowest concentration (>90 mg/m3). These include reductions in litter size, increased post-implantation losses, alterations in sperm morphology, and changes in sperm count and motility. Available data on the non-neoplastic effects of repeated exposure to ethylene oxide in studies are limited, with past focus being primarily on the carcinogenicity of the compound. Reported effects in studies in animals were restricted primarily to those on the hematological and nervous systems. irritation eyes, skin, nose, throat; peculiar taste; headache; nausea, vomiting, diarrhea; dyspnea (breathing difficulty), cyanosis, pulmonary edema; drowsiness, lassitude (weakness, exhaustion), incoordination; EKG abnormal; eye, skin burns (liquid or high vapor concentration); liquid: frostbite; reproductive effects; ; In Animals: convulsions; liver, kidney damage [potential occupational carcinogen]
- STOT-single exposure: No data available.
- STOT-repeated exposure: IDENTIFICATION: Ethylene oxide is a colorless, high reactive gas at room temperature and pressure. It used in the manufacture of ethylene glycol and surfactants. It used in the manufacture of surfactants. Ethylene oxide is also used as a sterilant for health care materials and other heat-sensitive products. HUMAN EXPOSURE: Ethylene oxide is rapidly taken up via the lungs, distributed, and metabolized to ethylene glycol and to glutathione conjugates. Ethylene oxide can be absorbed though the skin from the gas phase or from aqueous solutions and is uniformly distributed throughout the body. Ethylene oxide is an alkylating agent and forms protein and DNA adducts. Hemoglobin adducts have been used for biomonitoring. Based on studies primarily in occupationally exposed populations, ethylene oxide is an ocular, respiratory, and dermal irritant and a sensitizing agent. Neurological effects (primarily sensorimotor polyneuropathy) have been observed in workers exposed to relatively high concentrations. The route of likely greatest exposure and focus of the human health is inhalation from air. There is some evidence of an association between exposure to ethylene oxide and the development of haematological cancers in epidemiological studies of occupationally exposed populations, limitations of the data preclude definitive conclusions. There is consistent evidence that ethylene oxide has induced clastogenic changes

in exposed workers. ANIMAL/PLANT STUDIES: The acute inhalation toxicity of ethylene oxide in rodents and dogs is low. In inhalation studies, ethylene oxide has induced a wide range of tumours (e.g., leukaemia, lymohoma, brain, lung). Ethylene oxide induces gene mutations at all phylogenetic levels tested in vitro and in vivo. It also induces germ cell mutations and clastogenic effects in experimental animals. In experimental animals, ethylene oxide is fetotoxic in the presence and absence of maternal toxicity at concentrations higher than those associated with cancer and other non-cancer (i.e., neurological) effects; it is teratogenic only at very high concentrations (above about 1600 mg/m3). Evidence from epidemiological studies of reproductive effects (primarily spontaneous abortions) of ethylene oxide in humans is limited. In experimental animals, among non-neoplastic effects, reproductive effects occur at lowest concentration (>90 mg/m3). These include reductions in litter size, increased post-implantation losses, alterations in sperm morphology, and changes in sperm count and motility. Available data on the non-neoplastic effects of repeated exposure to ethylene oxide in studies are limited, with past focus being primarily on the carcinogenicity of the compound. Reported effects in studies in animals were restricted primarily to those on the hematological and nervous systems. At high doses (>200 ppm) ethylene oxide irritates mucous membranes of the nose and throat; higher concentrations cause damage to the trachea and bronchi, progressing into the partial collapse of the lungs. High concentrations can cause pulmonary edema and damage the cardiovascular system. Because the odor threshold for ethylene oxide varies between 250 and 700 ppm, the gas will already be at toxic concentrations when it can be smelled. Ethylene oxide is carcinogenic, mutagenic and an irritant. With chronic low doses, an increased incidence of brain tumors and mononuclear cell leukemia was found in rats that had inhaled ethylene oxide at concentrations of 10, 33, or 100 mL/m3 over a period of two years. Studies of workers exposed to ethylene oxide in ethylene oxide factories or hospital sterilizing rooms have shown an increased incidence of leukemia, stomach cancer, cancer of the pancreas and Hodgkin's disease.
- Aspiration hazard: No data available.

Likely routes of exposure
- IDENTIFICATION: Ethylene oxide is a colorless, high reactive gas at room temperature and pressure. It used in the manufacture of ethylene glycol and surfactants. It used in the manufacture of surfactants. Ethylene oxide is also used as a sterilant for health care materials and other heat-sensitive products. HUMAN EXPOSURE: Ethylene oxide is rapidly taken up via the lungs, distributed, and metabolized to ethylene glycol and to glutathione conjugates. Ethylene oxide can be absorbed though the skin from the gas phase or from aqueous solutions and is uniformly distributed throughout the body. Ethylene oxide is an alkylating agent and forms protein and DNA adducts. Hemoglobin adducts have been used for biomonitoring. Based on studies primarily in occupationally exposed populations, ethylene oxide is an ocular, respiratory, and dermal irritant and a sensitizing agent. Neurological effects (primarily sensorimotor polyneuropathy) have been observed in workers exposed to relatively high concentrations. The route of likely greatest exposure and focus of the human health is inhalation from air. There is some evidence of an association between exposure to ethylene oxide and the development of haematological cancers in epidemiological studies of occupationally exposed populations, limitations of the data preclude definitive conclusions. There is consistent evidence that ethylene oxide has induced clastogenic changes in exposed workers. ANIMAL/PLANT STUDIES: The acute inhalation toxicity of ethylene oxide in rodents and dogs is low. In inhalation studies, ethylene oxide has induced a wide range of tumours (e.g., leukaemia, lymohoma, brain, lung). Ethylene oxide induces gene mutations at all phylogenetic levels tested in vitro and in vivo. It also induces germ cell mutations and clastogenic effects in experimental animals. In experimental animals, ethylene oxide is fetotoxic in the presence and absence of maternal toxicity at concentrations higher than those associated with cancer and other non-cancer (i.e., neurological) effects; it is teratogenic only at very high concentrations (above about 1600 mg/m3). Evidence from epidemiological studies of reproductive effects (primarily spontaneous abortions) of ethylene oxide in humans is limited. In experimental animals, among non-neoplastic effects, reproductive effects occur at lowest concentration (>90 mg/m3). These include reductions in litter size, increased post-implantation losses, alterations in sperm morphology, and changes in sperm count and motility. Available data on the non-neoplastic effects of repeated

exposure to ethylene oxide in studies are limited, with past focus being primarily on the carcinogenicity of the compound. Reported effects in studies in animals were restricted primarily to those on the hematological and nervous systems.

Symptoms related to the physical, chemical and toxicological characteristics
- IDENTIFICATION: Ethylene oxide is a colorless, high reactive gas at room temperature and pressure. It used in the manufacture of ethylene glycol and surfactants. It used in the manufacture of surfactants. Ethylene oxide is also used as a sterilant for health care materials and other heat-sensitive products. HUMAN EXPOSURE: Ethylene oxide is rapidly taken up via the lungs, distributed, and metabolized to ethylene glycol and to glutathione conjugates. Ethylene oxide can be absorbed though the skin from the gas phase or from aqueous solutions and is uniformly distributed throughout the body. Ethylene oxide is an alkylating agent and forms protein and DNA adducts. Hemoglobin adducts have been used for biomonitoring. Based on studies primarily in occupationally exposed populations, ethylene oxide is an ocular, respiratory, and dermal irritant and a sensitizing agent. Neurological effects (primarily sensorimotor polyneuropathy) have been observed in workers exposed to relatively high concentrations. The route of likely greatest exposure and focus of the human health is inhalation from air. There is some evidence of an association between exposure to ethylene oxide and the development of haematological cancers in epidemiological studies of occupationally exposed populations, limitations of the data preclude definitive conclusions. There is consistent evidence that ethylene oxide has induced clastogenic changes in exposed workers. ANIMAL/PLANT STUDIES: The acute inhalation toxicity of ethylene oxide in rodents and dogs is low. In inhalation studies, ethylene oxide has induced a wide range of tumours (e.g., leukaemia, lymohoma, brain, lung). Ethylene oxide induces gene mutations at all phylogenetic levels tested in vitro and in vivo. It also induces germ cell mutations and clastogenic effects in experimental animals. In experimental animals, ethylene oxide is fetotoxic in the presence and absence of maternal toxicity at concentrations higher than those associated with cancer and other non-cancer (i.e., neurological) effects; it is teratogenic only at very high concentrations (above about 1600 mg/m3). Evidence from epidemiological studies of reproductive effects (primarily spontaneous abortions) of ethylene oxide in humans is limited. In experimental animals, among non-neoplastic effects, reproductive effects occur at lowest concentration (>90 mg/m3). These include reductions in litter size, increased post-implantation losses, alterations in sperm morphology, and changes in sperm count and motility. Available data on the non-neoplastic effects of repeated exposure to ethylene oxide in studies are limited, with past focus being primarily on the carcinogenicity of the compound. Reported effects in studies in animals were restricted primarily to those on the hematological and nervous systems.

SECTION 12: Ecological information

SECTION 12: Ecological information

12.1 Toxicity
Not available.

12.2 Persistence and degradability
Not available.

12.3 Bioaccumulative potential
Not available.

12.4 Mobility in soil
Not available.

12.5 Results of PBT and vPvB assessment

Not available.

12.6 Endocrine disrupting properties
Not available.

12.7 Other adverse effects
Not available.

SECTION 13: Disposal considerations

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Dispose of contents/container in accordance with local/regional/national/international regulations. Do not discharge to drains or the environment. Incineration or disposal via a licensed waste contractor may be appropriate. Not available.

SECTION 14: Transport information

SECTION 14: Transport information

14.1 UN number
Not available.

14.2 UN proper shipping name
Not available.

14.3 Transport hazard class(es)
Not available.

14.4 Packing group
Not available.

14.5 Environmental hazards
Not available.

14.6 Special precautions for user
Not available.

14.7 Maritime transport in bulk according to IMO instruments
Not available.

SECTION 15: Regulatory information

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Not available.

15.2 Chemical safety assessment
Not available.

SECTION 16: Other information

SECTION 16: Other information

Product identifier: Ethylene Oxide Solution R2
Catalog No.: CS-ET-00229
CAS No.: 75-21-8
Synonyms: Ethylene oxide
Supplier: Clearsynth Labs Ltd., Mumbai, India
Emergency phone: +91-22-245045900

Revision date: Not available
Disclaimer: The information provided is based on data believed to be reliable; however, no warranty is expressed or implied regarding accuracy or completeness. Users must determine suitability for their particular purpose and comply with applicable regulations.

DISCLAIMER

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