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GPS Safety Summary - ETHYLENE

SUBSTANCE NAME

ETHYLENE

CHEMICAL IDENTITY

Name: ETHYLENE, ETHENE

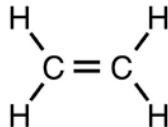
Chemical name (IUPAC): ETHENE

CAS number: 74-85-1

EC number: 200-815-3

Molecular formula: C₂H₄

Structure:



USES AND APPLICATIONS

Ethylene is present in the environment from various natural and anthropogenic sources. Ethylene is mainly used by the chemical industry as a monomer for the manufacture of Polyethylene. It is also used as a synthesis intermediate product in the manufacture of other chemicals or as fuel component.

PHYSICAL/CHEMICAL PROPERTIES

Phys/Chem Safety Assessment

Property	Value
Physical state (at 20°C)	Gas (compressed gas)
Colour	Colourless
Odour	Hydrocarbons
Melting / boiling point	-169°C/-104°C
Flammability	H220 - Extremely flammable gas
Explosive properties	Explosion limits (% vol) : upper = 36.0 ; lower = 2.7
Self-ignition temperature	450°C
Vapor pressure (at -90°C)	2124hPa
Mol weight	28 g/mol
Water solubility	Insoluble (131 mg/l at 25°C)
Octanol-water partition coefficient (LogKow) (at 20°C)	1.13

HEALTH EFFECTS

Human Health Safety Assessment

Effect Assessment	Result
Acute Toxicity	Inhalation : high levels of exposure may cause headache, drowsiness, loss of consciousness , asphyxia
Local effect	Inhalation : high levels of exposure may cause irritation to respiratory system
	Skin/Eye contact : refrigerated liquefied gas splashes may cause freeze burns
Sensitisation	Not regarded as a sensitising agent
Toxicity after repeated exposure	Inhalation : no significant toxic effects in animals after repeated exposure to high concentrations; no significant toxic potential expected in human
Genotoxicity / Mutagenicity	Non-genotoxic
Carcinogenicity	Absence of carcinogenic effects on animals
Reproductive toxicity	No toxic effect on fertility or on foetal development in animals



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ENVIRONMENTAL EFFECTS

Environment Safety Assessment

Ethylene is not acutely toxic to aquatic organisms. Because of its high volatility, Ethylene evaporates into the atmosphere where it is expected to undergo degradation in the presence of sunlight. The product is not considered to be either persistent and/or bioaccumulative, nor very persistent and very bioaccumulative. Ethylene is unlikely to cause ground or water pollution.

EXPOSURE

Human health

Consumer: Consumers may be exposed to trace amounts of Ethylene through natural sources (emission from vegetation of all types) and anthropogenic sources (combustion of gas, fuel, and/or coal). Consumers may also be exposed to Ethylene as a trace component of certain products (e.g. polymers).

Worker: Ethylene is mainly used either in closed process with no likelihood of exposure or in closed continuous process with occasional situations where controlled exposure can occur. Workers may be exposed to Ethylene during, for example, product transfer operations, product sampling, or maintenance/repair activities. Exposure is minimized as operation conditions and management measures recommended into the SDS must be applied.

Environment

Exposure to the environment cannot be excluded during production of Ethylene, formulation, synthesis of polymers or others chemicals, and when consumer used fuel containing Ethylene. Procedural and control technologies are used to minimize emissions and any resulting exposures. Ethylene is not classified as hazardous for the environment. Nevertheless, if an accidental release occurs, all the emergency procedures are described into the Safety Data Sheet (SDS).

RISK MANAGEMENT RECOMMENDATIONS

Always handle the product in accordance with good industrial hygiene and safety procedures and apply risk management measures recommended into SDS Workers must use appropriate Personal protective equipment (PPE) such as gloves, goggles, safety shoes, respiratory protective equipment, etc..., especially, during operations where emission may occur, like product transfer operations,



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product sampling, or maintenance/repair activities.

When using the product, never subject a cylinder to severe mechanical shock. Avoid producing or diffusing fumes, vapour or spray into the air. As the product may form flammable / explosive vapor-air mixture, all possible sources of ignition must be removed. Handle under adequate ventilation. When using, do not eat, drink or smoke.

Specific risk management measures are reported for each identified use in the SDS.

STATE AGENCY REVIEW

- This substance has been registered under REACH (EC) 1907/2006.
- This substance has been evaluated under OECD HPV program.

REGULATORY INFORMATION / CLASSIFICATION AND LABELLING

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the SDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according CLP (EC) 1272/2008.

Classification of the substance

EC-GHS (CLP) Classification according to the regulation EC 1272/2008 (EC-GHS) and ATP

Flam. Gas 1
Press. Gas
STOT SE 3

Pictogram(s) GHS02, GHS04, GHS07





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H Phrase(s)

H220 - Extremely flammable gas.

H280 - Contains gas under pressure; may explode if heated.

H336 - May cause drowsiness or dizziness.

P Phrase(s)

P201 - Obtain special instructions before use.

P210 - Keep away from heat/sparks/open flames/hot surfaces. — No smoking.

P243 - Take precautionary measures against static discharge.

P273 - Avoid release to the environment.

P309/311 - IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 - Eliminate all ignition sources if safe to do so.

P410/403 - Protect from sunlight. Store in a well-ventilated place.

CONCLUSION

- Ethylene is mainly used by the chemical industry as a monomer for the manufacture of Polyethylene, or as a synthesis intermediate product in the manufacture of other chemicals.
- Ethylene may cause drowsiness, dizziness, etc after exposure to high levels of Ethylene. No significant toxic potential is expected in human after high repeated exposure to Ethylene. It is not classified hazardous for the environment. Its main hazard is an extreme flammability.
- Exposure to humans and the environment is considered low if properly handled.

CONTACT INFORMATION WITHIN COMPANY

For further information on this substance or product safety summaries in general, please contact: pch.reach@total.com

Or visit the ICCA portal on: <http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>

GLOSSARY

Acute Toxicity	Harmful effect resulting from a single or short term exposure to a substance
Anthropogenic	designates an effect or object resulting from human activity
Biodegradation	Decomposition or breakdown of a substance under natural conditions (actions of micro organisms etc)
Bioaccumulation	Progressive accumulation in living organisms of a chemical substance present in the environment
Carcinogenicity	Substance effects causing cancer
Genotoxicity	Substance effect that causes damage to genes, including Mutagenicity and clastogenicity
GHS	Global Harmonized System of chemicals classification
Hazard	Inherent substance property bearing a threat to health or environment
Mutagenicity	Substance effect that cause mutation on genes
Persistence	Refers to the length of time a compound stays in the environment, once introduced
Reprotoxicity	Including
Sensitising	Allergenic

DISCLAIMER

The information contained in this paper is intended as basic advice and general information to this designated specific product (substance) only and whilst this information is provided in utmost good faith and has been based on the best information to our belief and to our knowledge currently available, it is to be relied upon at the user's own risk. The information in this paper is not intended to provide medical or medical emergency response information, nor treatment information; all detailed safety and health



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information is to be found in the Safety Data Sheets (SDS) for the product (substance) concerned and to be consulted before use of this product (substance). The information in this Safety Summary is not replacing the SDS and is not automatically applicable if this product (substance) is used with other products (substances) or in other processes.

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