

**SAFETY DATA SHEET (SDS)****ETHYLENE****1. Identification**

SDS record number	:	PCS 95001
Date of SDS	:	01 October 2013
Identity of the substance	:	Ethylene
Product Description	:	Olefinic hydrocarbon
Other names/synonyms	:	Ethylene, Ethene, Acetene, Liquid Ethylene
Name of the supplier	:	Petrochemical Corporation of Singapore (Private) Limited
Recommended uses	:	Chemical feedstock
Contact detail of the supplier	:	100 Ayer Merbau Road, Singapore 628277 +65 68672102
24-Hour Emergency contact	:	Asia Pacific +65 3158 1074 (Singapore) China +86 10 5100 3039 (Beijing) Europe, Israel & Americas +44 (0) 1235 239 670 (UK) Middle East & Africa +44 (0) 1235 239 671 (UK)

2. Hazards Identification**GHS Classification**

<u>Hazard Class</u>	<u>Hazard Category</u>
• Flammable Gas	1
• Gases under pressure	Liquefied gas
• STOST (Single Exposure)	3 (narcotic effects)

Pictograms**Signal Word:** Danger**Hazard Statements**

- Extremely flammable gas
- Contains gas under pressure; may explode if heated
- Vapours may cause drowsiness or dizziness

Precautionary Statements

Prevention

- Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Use only outdoors or in well-ventilated area.



Response

- Call a POISON CENTER/doctor/physician if you feel unwell.
- If INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
- Leaking gas fire : Do not extinguish, unless leak can be stopped safely
- Eliminate all ignition sources if safe to do so.

Storage

- Store in a well-ventilated place.
- Store in a well-ventilated place. Keep container tightly closed.
- Protect from sunlight and store in well-ventilated place.
- Store locked up.

Disposal

- Dispose of the contents in accordance to the local mandatory rules and regulations

Other Hazards which do not result in classification:

- High gas concentrations will displace available oxygen from the air, unconsciousness and death may occur suddenly from lack of oxygen

3. Composition/Information On Ingredients

Chemical identification	:	Ethylene
Common name(s) / synonym(s)	:	Ethylene, Ethene, Acetene, Liquid Ethylene
CAS number / EC number	:	74-85-1/200-815-3

4. First-Aid Measures

Inhalation: In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

Eye contact: First aid is normally not required.

Skin contact: In case of cold burns caused by rapidly expanding gas or vapourizing liquid, get prompt medical attention.

Ingestion: First aid is not applicable.

5. Fire-Fighting Measures

Extinguishing media

- Use water spray to cool fire exposed surfaces and to protect personnel.
- Shut off fuel to fire if possible to do so without hazard.
- If a leak or spill has not ignited use water spray to disperse the vapours.
- Extinguish small residual fires with dry chemical powder or water spray.
- Try to cover liquid spills with foam.
- Do not extinguish flames at leak because possibility of uncontrolled explosive re-ignition exists.
- Cut off fuel and/or allow fire to burn out.

Special protective equipment and precautions for fire fighters

- A self-contained breathing apparatus (SCBA) is recommended for indoor fires and any significant outdoor fires.
 - For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA is optional.
-



6. Accidental Release Measures

- Personal protection: chemical protection suit including self-contained breathing apparatus.
 - Notify the appropriate authorities immediately.
 - Take all additional action necessary to prevent and remedy the adverse effects of the spill.
 - Keep public away.
 - Prevent additional discharge of material, if possible to do so without hazard.
 - Warn occupants and shipping in surrounding and downwind areas of fire and explosion hazard and request all to stay clear.
 - Allow spillage to evaporate.
 - Evacuate danger area!
 - Provide adequate ventilation.
 - Remove all ignition sources and turn off gas at source if possible.
-

7. Handling And Storage

Precautions for safe handling

- Keep container closed. Handle and open containers with care.
 - Do not handle or store near an open flame, heat, or other sources of ignition.
 - Empty product containers may contain product residue.
 - Do not reuse empty containers without commercial cleaning or reconditioning.
 - Do not pressurize, cut, heat, or weld containers.
 - Do not breathe gas. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.
- Conditions for safe storage, including any incompatibilities
- Store in a cool, well-ventilated place.
 - Protect material from direct sunlight.
 - Material will accumulate static charges, which may cause an electrical spark (ignition source).
 - Use proper grounding procedures.
-

8. Exposure Controls/Personal Protection

Appropriate Engineering Controls

- The use of mechanical ventilation is recommended whenever this material is used in a confined space to maintain airborne concentrations below recommended occupational exposure limits.
- Use explosion-proof ventilation equipment.

Personal Protective Equipment (PPE)

- The selection of personal protective equipment varies depending upon conditions of use.
 - Where prolonged and/or repeated eye contact is likely to occur, wear gas-proof goggles.
 - Where eye contact is unlikely, but may occur as a result of short and/or periodic exposures, wear gas-proof goggles.
 - Where it is likely that frostbite hazards may occur from vaporizing liquid and expanding vapor, prevent contact with eyes and skin.
 - Wear safety glasses with side shields, long sleeves and insulating gloves.
 - **Personal protection:** chemical protection suit including self-contained breathing apparatus.
 - High concentrations in the air cause a deficiency of oxygen with the risk of unconsciousness or death. Check oxygen content before entering area
-



9. Physical And Chemical Properties

Property	Value, Description
Appearance (physical state, colour etc);	Colorless gas
Odour;	Faint sweet odor
Odour threshold;	Not available
pH;	Not applicable
Melting point/freezing point;	-169 deg C
Initial boiling point and boiling range;	-104 deg C
Flash point;	-100 deg C Closed Cup
Evaporation rate;	Not applicable
Upper/lower flammability or explosive limits;	2.7 to 28.6 % by volume
Vapour pressure;	5,168 kPa at 10 deg C
Vapour density;	1.178 kg/m ³ @ 1.013 bar 15 deg C
Relative density;	0.974 @ 1.013 bar 0 deg C (Air = 1)
Solubility(ies);	Solubility in Water: 0.01% at 20 deg C
Partition coefficient: n-octanol/water;	Not available
Auto-ignition temperature;	450 deg C
Decomposition temperature;	Not available
Viscosity.	0.4 cST at -50 deg C Approximate
Molecular Wt:	28
Critical temperature:	50 Deg.F (10 Deg.C)

10. Stability And Reactivity

Reactivity/Chemical stability: Product is stable under normal operating conditions.

Possibility of hazardous reactions: Contamination can cause self-reaction.

Conditions to avoid: it will vigorously polymerize, decompose, condense or become self-reactive under conditions of shock, pressure or temperature.

Incompatible materials: Inorganic acids, organic acids, molten sulfur, halogens, halogenated compounds, nitrogen dioxide, methyl chloride, carbon tetrachloride, trifluoromethyl hypofluorite, ozone, chlorine, nitromethane, aluminum chloride, oxidizing agents

When 5A molecular sieves were used to dry a compressed ethylene gas stream, an exothermic reaction took place and may cause an explosion. Smaller 3A molecular sieves are not catalytically active toward ethylene.

Hazardous decomposition products: Thermal decomposition or burning may produce CO and CO₂.

- The substance may polymerize to form aromatic compounds under the influence of temperatures above 600°C.
- Reacts with strong oxidants causing fire and explosion hazard.



11. Toxicological Information

Inhalation: Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects. Causes suffocation (asphyxiant) if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.

Eye contact: Exposure to rapidly expanding gas or vapourizing liquids may cause frostbite (cold burns) or tissue damage.

Skin contact: Exposure to rapidly expanding gas or vapourizing liquid may cause frostbite (cold burn). Not considered to be a hazard. In case of frostbite, place affected area in warm water until circulation returns.

Ingestion: Not considered to be a hazard.

Chronic: In high exposure animal studies with ethylene, there was evidence of slight changes in liver metabolism. The relationship of these studies to humans has not been fully established.

Occupational exposure limit

Manufacturer recommends: 1000 ppm recommended based on composition.

12. Ecological Information

No data on possible ecological toxicity.

13. Disposal Considerations

Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. Transport Information

UN Number: UN 1962

UN Proper Shipping Name: Ethylene, compressed

Transport hazard class(es): Class 2.1

Packing Group, if applicable: X

WHMIS Information:

Class B, Division 1: Flammable Gases

Transport Emergency Card: TEC (R)-20S1962

F+ symbol

R: 12-67

S: 2-9-16-33-46

UN Hazard Class: 2.1



15. Regulatory Information

Safety, health and environmental regulations specific for the product in question

NFPA Code: H1; F4; R2

ICSC # 0475

CAS # 74-85-1

UN # 1962

EC # 601-010-00-3

TLV: Simple asphyxiant; A4; (ACGIH 2004).

R: 12-67

S: 2-9-16-33-46

Occupational exposure limits: TLV: Simple asphyxiant; A4; (ACGIH 2004).

16. Other Information

Prepared By: Material Safety Committee

SDS Prepared on: 1/10/2010

CAUTION: The information given above (“**the Information**”) relates only to the substance or mixture listed herein. The Information may not be valid when used in combination with any other substance or mixture or in any process. If the substance or mixture is to be used for a purpose other than that stated herein or under conditions other than specified herein, the Information cannot be relied upon as being complete or accurate, and the user is advised to consult the supplier before using the substance or mixture for such other purpose or under such other conditions. The Information is given based on information available at the indicated date of preparation and no representation or warranty is given that it will be correct as of any time after the indicated date of preparation.