MATERIAL SAFETY DATA SHEET (MSDS)          ETHYLENE

Date prepared: September 21, 2009
Revision date:

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SUBSTANCE: ETHYLENE
TRADE NAMES/SYNONYMS:
ACETENE; ETHENE; ETHYLENE, COMPRESSED GAS; OLEFIANT GAS;
BICARBURETTED HYDROGEN; UN 1962; C2H4; 00232329; RTECS KU5340000
CHEMICAL FAMILY: hydrocarbons, aliphatic

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: ETHYLENE
CAS NUMBER: 74-85-1
PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=4 REACTIVITY=2
EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: compressed gas
ODOR: sweet odor
MAJOR HEALTH HAZARDS: central nervous system depression, difficulty breathing
PHYSICAL HAZARDS: Flammable gas. May cause flash fire. May polymerize. Containers may rupture or explode.
POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: nausea, vomiting, symptoms of drunkenness, bluish skin color, suffocation, convulsions, coma
LONG TERM EXPOSURE: no information on significant adverse effects

SKIN CONTACT:
SHORT TERM EXPOSURE: blisters, frostbite
LONG TERM EXPOSURE: no information is available

EYE CONTACT:
SHORT TERM EXPOSURE: frostbite, blurred vision
LONG TERM EXPOSURE: no information is available

INGESTION:
SHORT TERM EXPOSURE: frostbite
LONG TERM EXPOSURE: no information is available
4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

EYE CONTACT: Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Severe explosion hazard. Pressurized containers may rupture or explode if exposed to sufficient heat. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical
Large fires: Flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Stop flow of gas.

LOWER FLAMMABLE LIMIT: 2.7%
UPPER FLAMMABLE LIMIT: 36%
AUTOIGNITION: 842 F (450 C)

6. ACCIDENTAL RELEASE MEASURES

7. HANDLING AND STORAGE


8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
ETHYLENE:
No occupational exposure limits established.

VENTILATION: Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

GLOVES: Wear insulated gloves.

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas
COLOR: colorless
PHYSICAL FORM: compressed gas
ODOR: sweet odor
TASTE: sweet taste
MOLECULAR WEIGHT: 28.05
MOLECULAR FORMULA: C-H2-C-H2
BOILING POINT: -155 F (-104 C)
FREEZING POINT: -272 F (-169 C)
VAPOR PRESSURE: 760 mmHg @ -104 C
VAPOR DENSITY (air=1): 1.0
SPECIFIC GRAVITY: Not applicable
DENSITY: 1.261 g/L @ 0 C
10. STABILITY AND REACTIVITY

REACTIVITY: May polymerize. Avoid storage and use above room temperature.
CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat.
INCOMPATIBILITIES: acids, metal salts, halogens, halo carbons, oxidizing materials, metals, peroxides
HAZARDOUS DECOMPOSITION:
Thermal decomposition products: oxides of carbon
POLYMERIZATION: Polymerizes with evolution of heat. Store in a cool, dry place.

11. TOXICOLOGICAL INFORMATION

ETHYLENE:
TOXICITY DATA: 95 ppm/2 hour(s) inhalation-mouse LC50
CARCINOGEN STATUS: IARC: Human Inadequate Evidence, Animal Inadequate Evidence, Group 3;
ACGIH: A4 -Not Classifiable as a Human Carcinogen
ACUTE TOXICITY LEVEL:
Highly Toxic: inhalation
TARGET ORGANS: central nervous system
ADDITIONAL DATA: Interactions with drugs may occur.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 22000-25000 ug/L 1 day(s) LC100 (Mortality) Orangespotted sunfish (Lepomis humilis)
FATE AND TRANSPORT:
KOW: 281.84 (log = 2.45) (estimated from water solubility)
KOC: 779.83 (log = 2.90) (estimated from water solubility)
HENRY’S LAW CONSTANT: 1.2 E -4 atm-m3/mol
BIOCONCENTRATION: 0.58 (estimated from water solubility)
AQUATIC PROCESSES: 1.3766980 hours (River Model: 1 m deep, 1 m/s flow, 3 m/s wind)
ENVIRONMENTAL SUMMARY: Relatively non-persistent in the environment. Leaches through the soil or the sediment at a slow rate. Accumulates very little in the bodies of living organisms. Moderately volatile from water.
13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Ethylene
ID NUMBER: UN1962
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HAZARD CLASS OR DIVISION: 2.1
LABELING REQUIREMENTS: 2.1
QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: 150 kg
CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Ethylene, compressed
UN NUMBER: UN1962
CLASS: 2.1

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.
SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: Yes
SARA TITLE III SECTION 313 (40 CFR 372.65):
ETHYLENE
STATE REGULATIONS:
California Proposition 65: Not regulated.
CANADIAN REGULATIONS:
NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.
TSCA 12(b) EXPORT NOTIFICATION: Not listed.
16. OTHER INFORMATION

THE INFORMATION, RECOMMENDATIONS, AND SUGGESTIONS HEREIN WERE COMPILED FROM REFERENCE MATERIAL AND OTHER SOURCES BELIEVED TO BE RELIABLE. HOWEVER, THE MSDS’S ACCURACY OR COMPLETENESS IS NOT GUARANTEED BY GAS INNOVATIONS OR ITS AFFILIATES, NOR IS ANY RESPONSIBILITY ASSUMED OR IMPLIED FOR ANY LOSS OR DAMAGE RESULTING FROM INACCURACIES OR OMISSIONS. SINCE CONDITIONS OF USE ARE BEYOND OUR CONTROL, NO WARRANTIES OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSED OR IMPLIED. THIS MSDS IS NOT INTENDED AS A LICENSE TO OPERATE UNDER, OR RECOMMENDATION TO INFRINGE ON, ANY PATENTS. APPROPRIATE WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS.