SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Ethane
Catalog Number : io-2319
CAS Number : 74-84-0
Identified uses : Laboratory chemicals, manufacture of chemical compounds
Company : Ionz

>> R&D Use only

2. Hazards Identification

GHS Classification:

Flammable liquid (category 2)
Acute toxicity, oral (Category 3)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 3)
Specific target organ toxicity, single exposure (Category 1)

Pictogram(s)

GHS Hazard Statements

>> H220 (99.7%): Extremely flammable gas [Danger Flammable gases]

>> H280 (59.3%): Contains gas under pressure; may explode if heated [Warning Gases under pressure]

>> H281 (17.6%): Contains refrigerated gas; may cause cryogenic burns or injury [Warning Gases under pressure]

Precautionary Statement Codes

>> P203, P210, P222, P280, P282, P336+P317, P377, P381, P403, and P410+P403

NFPA 704 Diamond

NFPA Health Rating

>> 1 - Materials that, under emergency conditions, can cause significant irritation.

NFPA Fire Rating

>> 4 - Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.

NFPA Instability Rating

>> 0 - Materials that in themselves are normally stable, even under fire conditions.

Health Hazards:

>> In high vapor concentrations, can act as simple asphyxiant. Liquid causes severe frostbite. (USCG, 1999)

ERG 2024, Guide 115 (Ethane; Ethane, compressed; Ethane, refrigerated liquid)

>> Vapors may cause dizziness or asphyxiation without warning, especially when in closed or confined areas.

>> Some may be irritating if inhaled at high concentrations.

>> Contact with gas, liquefied gas or cryogenic liquids may cause burns, severe injury and/or frostbite.

>> Fire may produce irritating and/or toxic gases.

ERG 2024, Guide 115 (Ethane, compressed; Ethane; Ethane, refrigerated liquid)

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>> Some may be irritating if inhaled at high concentrations.

>> Contact with gas, liquefied gas or cryogenic liquids may cause burns, severe injury and/or frostbite.

>> Fire may produce irritating and/or toxic gases.

>> Excerpt from ERG Guide 115 [Gases - Flammable (Including Refrigerated Liquids)]:

>> EXTREMELY FLAMMABLE. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Vapors from liquefied gas are initially heavier than air and spread along ground. CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966), Methane (UN1971) and Hydrogen and Methane mixture, compressed (UN2034) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.) Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. CAUTION: When LNG - Liquefied natural gas (UN1972) is released on or near water, product may vaporize explosively. (ERG, 2024)

ERG 2024, Guide 115 (Ethane; Ethane, compressed; Ethane, refrigerated liquid)

>> EXTREMELY FLAMMABLE.

>> Will be easily ignited by heat, sparks or flames.

>> Will form explosive mixtures with air.

>> Vapors from liquefied gas are initially heavier than air and spread along ground.

>> CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966), Methane (UN1971) and Hydrogen and Methane mixture, compressed (UN2034) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

>> Vapors may travel to source of ignition and flash back.

>> Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.

>> Containers may explode when heated.

>> Ruptured cylinders may rocket.

>> CAUTION: When LNG - Liquefied natural gas (UN1972) is released on or near water, product may vaporize explosively.

ERG 2024, Guide 115 (Ethane, compressed; Ethane; Ethane, refrigerated liquid)

>> EXTREMELY FLAMMABLE.

>> Will be easily ignited by heat, sparks or flames.

>> Will form explosive mixtures with air.

>> Vapors from liquefied gas are initially heavier than air and spread along ground.

>> CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966), Methane (UN1971) and Hydrogen and Methane mixture, compressed (UN2034) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

>> Vapors may travel to source of ignition and flash back.

>> Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.

>> Containers may explode when heated.

>> Ruptured cylinders may rocket.

>> CAUTION: When LNG - Liquefied natural gas (UN1972) is released on or near water, product may vaporize explosively.

>> Extremely flammable. Gas/air mixtures are explosive.

3. Composition/Information On Ingredients

Chemical name : Ethane
CAS Number : 74-84-0
Molecular Formula : C2H6
Molecular Weight : 30.0700 g/mol

4. First Aid Measures

First Aid:

>> Remove from exposure; support respiration. (USCG, 1999)

ERG 2024, Guide 115 (Ethane; Ethane, compressed; Ethane, refrigerated liquid)

>> General First Aid:

>> Call 911 or emergency medical service.

>> Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.

>> Move victim to fresh air if it can be done safely.

>> Administer oxygen if breathing is difficult.

>> If victim is not breathing:

>> DO NOT perform mouth-to-mouth resuscitation; the victim may have ingestedor inhaled the substance.

>> If equipped and pulse detected, wash face and mouth, then give artificial respiration using a proper respiratory medical device (bag-valve mask, pocket mask equipped with a one-way valve or other device).

>> If no pulse detected or no respiratory medical device available, provide continuouscompressions. Conduct a pulse check every two minutes or monitor for any signs of spontaneous respirations.

>> Remove and isolate contaminated clothing and shoes.

>> For minor skin contact, avoid spreading material on unaffected skin.

>> In case of contact with substance, remove immediately by flushing skin or eyes with running water for at least 20 minutes.

>> For severe burns, immediate medical attention is required.

>> Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

>> Keep victim calm and warm.

>> Keep victim under observation.

>> For further assistance, contact your local Poison Control Center.

>> Note: Basic Life Support (BLS) and Advanced Life Support (ALS) should be done by trained professionals.

>> Specific First Aid:

>> Clothing frozen to the skin should be thawed before being removed.

>> In case of contact with liquefied gas, only medical personnel should attempt thawing frosted parts.

>> In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.

>> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the "ERAP" section.

ERG 2024, Guide 115 (Ethane, compressed; Ethane; Ethane, refrigerated liquid)

>> General First Aid:

>> Call 911 or emergency medical service.

>> Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.

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>> Administer oxygen if breathing is difficult.

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First Aid Measures

Inhalation First Aid

>> Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

Skin First Aid

>> ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention .

Eye First Aid

>> First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

5. Fire Fighting Measures

>> Flashback along vapor trail may occur.

>> Excerpt from ERG Guide 115 [Gases - Flammable (Including Refrigerated Liquids)]:

>> DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED. CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Hydrogen and Methane mixture, compressed (UN2034) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.).

>> SMALL FIRE: Dry chemical or CO2.

>> LARGE FIRE: Water spray or fog. If it can be done safely, move undamaged containers away from the area around the fire. CAUTION: For LNG - Liquefied natural gas (UN1972) pool fires, DO NOT USE water. Use dry chemical or high-expansion foam.

>> FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks in direct contact with flames. For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn. (ERG, 2024)

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>> Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out. In other cases extinguish with water spray, powder. In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.

6. Accidental Release Measures

Isolation and Evacuation:

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 115 [Gases - Flammable (Including Refrigerated Liquids)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

>> LARGE SPILL: Consider initial downwind evacuation for at least 800 meters (1/2 mile).

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions. In fires involving Liquefied Petroleum Gases (LPG) (UN1075), Butane (UN1011), Butylene (UN1012), Isobutylene (UN1055), Propylene (UN1077), Isobutane (UN1969), and Propane (UN1978), also refer to the "BLEVE - Safety Precautions" section. (ERG, 2024)

Evacuation: ERG 2024, Guide 115 (Ethane; Ethane, compressed; Ethane, refrigerated liquid)

>> Immediate precautionary measure

>> Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

>> Large Spill

>> Consider initial downwind evacuation for at least 800 meters (1/2 mile).

>> Fire

>> If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

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Spillage Disposal:

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. Remove all ignition sources. NEVER direct water jet on liquid.

Accidental Release Measures

Public Safety: ERG 2024, Guide 115 (Ethane; Ethane, compressed; Ethane, refrigerated liquid)

>> CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.

>> Keep unauthorized personnel away.

>> Stay upwind, uphill and/or upstream.

>> Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).

Spill or Leak: ERG 2024, Guide 115 (Ethane; Ethane, compressed; Ethane, refrigerated liquid)

>> ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.

>> All equipment used when handling the product must be grounded.

>> Do not touch or walk through spilled material.

>> Stop leak if you can do it without risk.

>> If possible, turn leaking containers so that gas escapes rather than liquid.

>> Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.

>> Do not direct water at spill or source of leak.

>> CAUTION: For LNG - Liquefied natural gas (UN1972), DO NOT apply water, regular or alcohol-resistant foam directly on spill. Use a high-expansion foam if available to reduce vapors.

>> Prevent spreading of vapors through sewers, ventilation systems and confined areas.

>> Isolate area until gas has dispersed.

>> CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

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7. Handling And Storage

Safe Storage:

>> Fireproof. Cool. Separated from strong oxidants and halogens.

Storage Conditions:

>> Keep container tightly closed in a dry and well-ventilated place.

8. Exposure Control/ Personal Protection

>> Minimal Oxygen Content. ACGIH recommends a minimal ambient oxygen partial pressure of 132 torr, which is protective against inert oxygen-displacing gases and oxygen-consuming processes for altitudes up to 5000 feet.

Emergency Response: ERG 2024, Guide 115 (Ethane; Ethane, compressed; Ethane, refrigerated liquid)

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>> CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Hydrogen and Methane mixture, compressed (UN2034) will burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

>> Small Fire

>> Dry chemical or CO2.

>> Large Fire

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>> If it can be done safely, move undamaged containers away from the area around the fire.

>> CAUTION: For LNG - Liquefied natural gas (UN1972) pool fires, DO NOT USE water. Use dry chemical or high-expansion foam.

>> Fire Involving Tanks

>> Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.

>> Cool containers with flooding quantities of water until well after fire is out.

>> Do not direct water at source of leak or safety devices; icing may occur.

>> Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

>> ALWAYS stay away from tanks in direct contact with flames.

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>> ALWAYS stay away from tanks in direct contact with flames.

>> For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Inhalation Risk:

>> On loss of containment this substance can cause suffocation by lowering the oxygen content of the air in confined areas.

Effects of Short Term Exposure:

>> Rapid evaporation of the liquid may cause frostbite.

Fire Prevention

>> NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding) if in liquid state. Use non-sparking handtools.

Inhalation Prevention

>> Use ventilation, local exhaust or breathing protection.

Skin Prevention

>> Cold-insulating gloves. Protective clothing.

Eye Prevention

>> Wear face shield.

Exposure Control and Personal Protection

Protective Clothing: ERG 2024, Guide 115 (Ethane; Ethane, compressed; Ethane, refrigerated liquid)

>> Wear positive pressure self-contained breathing apparatus (SCBA).

>> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

>> Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

Protective Clothing: ERG 2024, Guide 115 (Ethane, compressed; Ethane; Ethane, refrigerated liquid)

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>> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

>> Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

9. Physical And Chemical Properties

Molecular Weight:

>> 30.07

Exact Mass:

>> 30.0469501914

Physical Description:

>> Ethane appears as a colorless odorless gas. It is easily ignited. The vapors are heavier than air. It can asphyxiate by the displacement of air. Under prolonged exposure to fire or intense heat the containers may rupture violently and rocket. Contact with the liquid may cause frostbite.

>> COLOURLESS COMPRESSED LIQUEFIED GAS. ODOURLESS WHEN PURE.

Color/Form:

>> Colorless gas

Odor:

>> Odorless

Boiling Point:

>> -127.5 °F at 760 mmHg (USCG, 1999)

>> -89 °C

Melting Point:

>> -279.9 °F (USCG, 1999)

>> -183 °C

Flash Point:

>> -211 °F (USCG, 1999)

>> Flammable gas

Solubility:

>> In water, 60.2 mg/L at 25 °C

>> Solubility in water, ml/100ml at 20 °C: (very poor)

Density:

>> 0.546 at -127.48 °F (USCG, 1999) - Less dense than water; will float

Vapor Density:

>> 1.04 (Air = 1)

>> Relative vapor density (air = 1): 1.05

Vapor Pressure:

>> VP: 1 Pa at -183.3 °C (solid); 10 Pa at -173.2 °C; 100 Pa at -161.3 °C; 1 kPa at -145.3 °C; 10 kPa at -122.8 °C; 100 kPa at -88.8 °C

>> Vapor pressure, kPa at 20 °C: 3850

LogP:

>> log Kow = 1.81

>> 1.81

Autoignition Temperature:

>> 940 °F (USCG, 1999)

>> 472 °C

Viscosity:

>> 6.4 at 200 K; 9.4 at 300 K; 12.2 at 400 K; 14.8 at 500 K; 18.1 at 600 K (all in uPa.s)

Heat of Combustion:

>> 1727 btu/cu ft at 25 °C

Heat of Vaporization:

>> 5.16 kJ/mol at 25 °C

Surface Tension:

>> 16 dynes/cm = 0.016 N/m at -88 °C

Odor Threshold:

>> 8.99X10+2 ppm (detection in water, purity not specified)

Refractive Index:

>> INDEX OF REFRACTION: 1.0377 @ 0 °C/D & 546 MM HG

10. Stability And Reactivity

>> Highly flammable.

>> Highly Flammable

11. Toxicological Information

Exposure Routes:

>> The substance can be absorbed into the body by inhalation.

Inhalation Exposure

>> Suffocation.

Skin Exposure

>> ON CONTACT WITH LIQUID: FROSTBITE.

Eye Exposure

>> ON CONTACT WITH LIQUID: FROSTBITE.

Adverse Effects:

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Neurotoxin - Acute solvent syndrome

>> Other Poison - Simple Asphyxiant

Antidote and Emergency Treatment:

>> FIRST AID: Skin--ON CONTACT WITH LIQUID FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention; Eyes--ON CONTACT WITH LIQUID FROSTBITE. First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ Ethane is considered to be physiologically and toxicologically inert. At high concn, ethane acts primarily as a simple asphyxiant by displacing oxygen from the blood and air. Oxygen deprivation and asphyxiation eventually lead to unconsciousness and death.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ Guinea pigs exposed to 2.2 to 5.5% for 2 hr show slight signs of irregular respiration, which is readily reversible on cessation of the exposure.

12. Ecological Information

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SEDIMENT: Ethane was detected in 10 of 10 sediment samples from Walvis Bay of the Namibian shelf of SW Africa at concentrations of 4.4, 4.1, 3.6, 2.8, 2.5, 5.0, 1.9, 2.0, 2.5, and 2.3 ng/g(1). Sediments from the Bering Sea contained ethane gas at concentrations ranging from 7 to 510 nL/L(2).

Average Daily Intake:

The average amount of the compound taken into the body through eating, drinking, or breathing.

>> AIR INTAKE: According to the National Ambient Volatile Organic Compounds (VOCs) Database, the median urban atmospheric concn of ethane is 9.150 ppbV for 571 samples. Based upon this figure and the value for average daily inhalation by a human adult of 20 cu m of air, the average daily intake of ethane via air is 183 mg(1).

13. Disposal Considerations

Spillage Disposal

>> Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. Remove all ignition sources. NEVER direct water jet on liquid.

Disposal Methods

>> Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

14. Transport Information

DOT

Ethane
2.1

IATA

Ethane
2.1,

15. Regulatory Information

DHS Chemicals of Interest (COI):

This section provides the Department of Homeland Security (DHS) Chemicals of Interest (COI) and related information (Ref: 6 eCFR part 27 - https://www.ecfr.gov/current/title-6/chapter-I/part-27).

Chemicals of Interest(COI)

>> Ethane

Release: Minimum Concentration (%)

>> 1

Release: Screening Threshold Quantities (in pounds)

>> 10000

Security Issue: Release - Flammables

>> Flammable chemical that can be released at a facility.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Ethane

REACH Registered Substance

>> Status: Active Update: 28-11-2022 https://echa.europa.eu/registration-dossier/-/registered-dossier/14543

REACH Registered Substance

>> Status: Cease Manufacture Update: 10-11-2008 https://echa.europa.eu/registration-dossier/-/registered-dossier/5099

New Zealand EPA Inventory of Chemical Status

>> Ethane: HSNO Approval: HSR000998 Approved with controls

16. Other Information

Toxic Combustion Products:

Toxic products (e.g., gases and vapors) produced from the combustion of this chemical.

>> Hazardous decomposition products formed under fire conditions. -Carbon oxides.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Ethane: Human health tier I assessment

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of

the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."