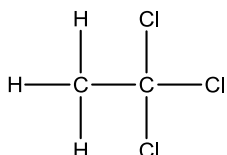


TRI-ETHANE™

CAS Number: 71-55-6
Synonyms: 1,1,1-trichloroethane, methyl chloroform
Chemical Formula: C₂H₃Cl₃
Molecular Weight: 133.40
Chemical Structure:



Refer to the Safety Data Sheet (SDS) for additional information and before handling this material.

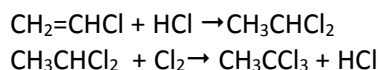
Description: Tri-Ethane is a clear, colorless liquid at room temperatures. By itself, it is non-flammable and has a sweet, but sharp, odor.

Product Overview

Tri-Ethane™ is used exclusively as a feedstock for the production of fluorinated chemical compounds, including refrigerants and polymers. Axiall Corporation produces *Tri-Ethane* at the Lake Charles, Louisiana plant. With over 60 years of responsible production and handling experience, Axiall manufactures *Tri-Ethane* with environmental and public safety consideration. Axiall personnel are experienced in handling and shipping *Tri-Ethane*, and our engineers, scientists, and sales representatives can provide technical assistance to users.

Production

Axiall produces *Tri-Ethane* using state of the art production techniques by the chlorination of ethylene, specifically by hydrochlorination of vinyl chloride to form 1,1-dichloroethane followed by chlorination as shown below. *Tri-Ethane* is then purified by distillation and stabilized to prevent decomposition.



Uses

Tri-Ethane is used exclusively as a feedstock for the production of fluorinated chemicals for refrigerants and other fluorinated compounds. Previously, *Tri-Ethane* had been used extensively as a chemical solvent. However, this use has been eliminated by the United Nation's Montreal Protocol.

Health Effects

Read and follow all instructions on the product label and review the Safety Data Sheet (SDS) to understand and avoid the hazards associated with *Tri-Ethane*. Wear appropriate personal protective equipment and avoid direct contact. Eye contact with *Tri-Ethane* causes serious eye irritation. Skin contact with *Tri-Ethane* causes skin irritation. *Tri-Ethane* may be aspirated into lungs during ingestion and/or subsequent vomiting; aspiration of this material will cause severe lung injury, chemical pneumonitis, pulmonary edema or death. Inhalation of *Tri-Ethane* may be harmful and may affect the central nervous system; symptoms may include dizziness, drowsiness, lethargy, coma and death. Adrenaline should only be administered after careful consideration following overexposure to *Tri-Ethane*; increased sensitivity of the heart to adrenaline may be caused by overexposure to this product.

Chronic inhalation overexposure to *Tri-Ethane* may cause damage to the liver and cardiovascular system. Repeated exposure to high vapor concentrations of *Tri-Ethane* may cause irritation of the respiratory system and permanent brain and nervous system damage. Inhalation of vapor/aerosol concentrations above the recommended exposure limits causes headaches, drowsiness and nausea and may lead to unconsciousness or death. It is strongly suggested that *Tri-Ethane* customers review their industrial hygiene programs and institute good operating practices designed to limit employee exposure below the established airborne exposure limits.

The United States Occupational Safety and Health Administration (OSHA) and the American Conference of Governmental Industrial Hygienists® (ACGIH) have established or recommended occupational airborne exposure limits for *Tri-Ethane*. The OSHA Permissible Exposure Limit (PEL) is an 8-hour time-weighted average (TWA) of 350 ppm. The ACGIH currently Threshold Limit Value® (TLV) is 350 ppm for an 8-hour TWA and 450 ppm for a 15-minute STEL, a short term exposure limit.

Depending on conditions, *Tri-Ethane* or its vapors, when in contact with flames, hot glowing surfaces or electric arc, can decompose to form hydrogen chloride gas, which is highly irritating to the nose and throat, and possible traces of phosgene, an extremely poisonous gas.

Before handling, it is important that engineering controls are operating and protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use and should be given the opportunity to review this document and the safety data sheet.

Environmental Effects

Tri-Ethane should be kept out of lakes, streams, ponds, or other water sources.

Tri-Ethane has a low bioaccumulation potential.

Exposure Potential

Precautions should be taken to minimize potential harm to people, animals, and the environment. Potential for exposure may vary depending upon site-specific conditions. When handling *Tri-Ethane*, always refer to the Safety Data Sheet and Product Warning Label and follow all instructions and warnings. Based on the expected uses for *Tri-Ethane*, exposure could be through:

- **Workplace exposure** - Exposure can occur either in a *Tri-Ethane* manufacturing facility or in the various industrial facilities that use *Tri-Ethane*. Good industrial hygiene practices and the use of personal protective equipment will, when combined with proper training and environment, health and safety practices, contribute to a safe work environment.
- **Environmental releases** - In the event of a spill, contain the spill to prevent contaminated soil, surface or ground water. Industrial spills (releases to soil or water) should be controlled by workplace spill programs which include containment around loading and unloading operations and storage tanks and employee training. Many aspects of a spill control program are mandated by federal, state and local requirements. In addition, if a spill occurs, governmental reporting may be required. Refer to the Safety Data Sheet for instructions to contain and clean up a spill to minimize exposure.
- **Consumer Exposure** - *Tri-Ethane* is not sold directly to consumers, and there are no uses that would result in consumer exposure. All product must be completely transformed.

Safe Handling and Storage

As tested by standard methods, *Tri-Ethane* has no flash point or fire point. *Tri-Ethane* vapor concentrations between 7% and 15% by volume in air are explosive by ignition. Depending upon conditions, this material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and possible traces of phosgene. Fire and explosion hazards can be minimized by adequate ventilation, using the proper types and arrangement of equipment, and reasonable precautions and care in handling.

Tri-Ethane should be stored away from direct sunlight in a dry, cool and well-ventilated area away from incompatible materials. It should not be stored above 35°C (95°F). Depending on conditions, when *Tri-Ethane* is exposed to high temperatures, heat, or ignition, hydrogen chloride gas, which is highly irritating to the nose and throat, as well as trace levels of phosgene gas, an extremely poisonous gas, may be produced. As a result, all ignition sources should be eliminated. All metal parts of equipment must be grounded to avoid ignition of vapors by static electricity discharge.

Avoid contact with strong alkalis, such as caustic soda, strong acids, and oxidizing agents, as well as aluminum, copper, zinc, or their alloys. Contact of *Tri-Ethane* solvent with aluminum must be avoided because solvent decomposition can occur. This reaction can be particularly dangerous in pressurized enclosed systems of aluminum construction. It will generate heat, pressure, and corrosive gases which may rupture the equipment with explosive-like force.

Appropriate personal protective equipment, as described in the *Tri-Ethane* Safety Data Sheet, should always be worn to avoid contact with the eyes, skin and clothing or to prevent the inhalation of the gas, fumes or vapor.

Packaging and Shipping

Axiall ships *Tri-Ethane* in tank trucks, tank cars and barges. The shipping point in the United States is Lake Charles, Louisiana.

- **Tank cars** - Single compartment rail cars are available with nominal capacities of 10,000 and 20,000 gallons.
- **Tank trucks** - Axiall ships *Tri-Ethane* in bulk tank trucks with a capacity of 20 tons.
- **Barges** – Axiall ships *Tri-Ethane* in barges of 1500 tons.

Fire and Explosion Hazards

Tri-Ethane by itself is nonflammable and non-explosive. *Tri-Ethane* has no flash or fire point as tested by standard methods. However high vapor concentrations (between 7-15% by volume) in air can be ignited by a high energy source. Since vapors are heavier than air, they will spread along the ground and may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

During a fire, promptly isolate the scene by removing all persons from the vicinity of the incident. No other action shall be taken without suitable training. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Physical and Chemical Properties

Tri-Ethane is a chlorinated hydrocarbon used as a feedstock in many chemical formulations. Chlorinated hydrocarbons tend to decompose when exposed to light, heat, oxygen, or water. This decomposition process is accelerated by the presence of metals and metal salts, and the presence of the decomposed solvent itself tends to catalyze further decomposition. To maximize stability, Axiall stabilizes all *Tri-Ethane* solvents prior to shipment.

Properties of <i>Tri-Ethane</i>	
Boiling Point	165.4°F (74.1°C)
Freezing Point	-49°F (-45°C)
Auto-ignition temperature	932°F (500°C)
Specific Gravity at 25°C	1.32
Vapor Pressure at 25°C	104.4 mm Hg

Regulatory Information

The *Tri-Ethane* Safety Data Sheet contains regulatory information, including Chemical Inventory Status, California Proposition 65 status, and Transportation Classifications. The following is additional regulatory information.

North American Regulatory Information

- **CONEG Regulation/Model Toxics in Packaging Legislation** - Lead, cadmium, mercury and hexavalent chromium are not intentionally added to *Tri-Ethane*, and based on the formula and Axiall's experience with the product, the sum of the incidental concentration levels of these metals is not expected to exceed 100 parts per million (ppm) by weight.
- **RCRA** – Commercial grade *Tri-Ethane*, if discarded or spilled, would be a listed hazardous waste under 40 CFR 261.33, specifically U226 – 1,1,1-Trichloroethane CAS 71-55-6. In addition, *Tri-Ethane*, if discarded or spilled, as well as other wastes generated during use of *Tri-Ethane* or containing *Tri-Ethane* may exhibit one or more hazardous waste characteristics under 40 CFR 261.24, including D028 – toxic. (Note: Axiall provides information on U.S. hazardous waste criteria for the product as manufactured. It remains the obligation of the user to evaluate their specific waste and to manage, treat, and dispose of unused material, residues, and containers in accordance with applicable federal, state, and local requirements.)
- **VOC Information** - *Tri-Ethane* is exempt from the definition of volatile organic compounds (VOC) as defined in 40 CFR 51.100.
- **HAP Information** - *Tri-Ethane* is a hazardous air pollutant (HAP) as listed in the Clean Air Act Amendments of 1990, 42 USC 7412 (b).
- **Ozone-Depleting Chemicals** - *Tri-Ethane* is an ozone depleting chemical (40 CFR 82, Subpart A, Appendix F).
- **Toxic Pollutants / Priority Pollutants** - *Tri-Ethane* contains toxic pollutants/priority pollutants as listed in 40 CFR 401.15.
- **CERCLA Hazardous Substance** - *Tri-Ethane* (1,1,1-trichloroethane) appears in the List of Hazardous Substances and Reportable Quantities table (40 CFR 302.4) with a reportable quantity (RQ) of 1000 pounds (454 Kg).

- **TSCA Information** - *Tri-Ethane* is not currently subject to any rule or order under TSCA Sections 4,5,7,8(a), or 8(d).

Other Regulatory Information

- **RoHS/WEEE** - *Tri-Ethane* has been reviewed with regard to the EU Directive 2011/65/EU “Restriction on the Use of Certain Hazardous Substances” (RoHS 2). Based on our knowledge of this product and information on the raw material suppliers’ Safety Data Sheets, this product does not contain cadmium, hexavalent chromium, lead, mercury, polybrominated biphenyls (PBBs) or polybrominated diphenyl ethers (PBDEs) at levels greater than the tolerated maximum concentration values established by the directive.

Additional Product Information

- **Source** - *Tri-Ethane* is derived from mineral and petroleum sources and has not been derived from plant, animal, synthetic or fermentation sources.
- **Allergenic Materials** - *Tri-Ethane* is not manufactured using any of the following allergenic materials: carmine/cochineal extracts, celery, colors/color additives, dyes/food dyes, eggs/egg products, seafood/fish/shellfish/crustaceans, flavors, glutens, legumes, milk, mollusks, monosodium glutamate (MSG), mustards, plant nuts/seeds/oils (sesame, sunflower, safflower, canola, etc.), peanuts/peanut products, protein hydrolysates, soy/soybeans/soybean products, spices, sulfites, sulfates, tree nuts/tree nut oils and wheat.
- **Bovine Spongiform Encephalopathy** - *Tri-Ethane* is not of animal origin, and, to Axiall’s knowledge, does not contribute to Transmissible Spongiform Encephalopathy (TSE)/Bovine Spongiform Encephalopathy (BSE).
- **Genetically Modified Organisms (GMOs)** - *Tri-Ethane* is not manufactured with and does not contain genetically modified organisms.
- **Natural Latex Rubber** - *Tri-Ethane* is not manufactured with and does not contain natural latex rubber as defined in 21 CFR 801.437(b)(1).
- **Nutritional Value** - *Tri-Ethane* does not have nutritional value.

Product Stewardship

Axiall Corporation is committed to managing *Tri-Ethane* so that it can be safely used by its employees and customers. Axiall’s relationships with its customers encourage communication about safety and environmental stewardship.

Additional Information

For more information regarding Axiall’s *Tri-Ethane*, contact our customer service department by calling 800-243-6774.

References

- Axiall Corporation Web page: <http://www.axiall.com/>
- Axiall Safety Data Sheets: <http://www.axiall.com/products/safety-data-sheets/>

Notice

Prior to its use, the user is responsible for determining the suitability of the product or products covered by this Product Stewardship Summary and for complying with all federal, state, and local laws and regulations in connection with its use. Neither Axiall Corporation nor any of its affiliates shall be responsible for any damages of any kind whatsoever resulting from the use of or reliance on this Product Stewardship Summary or product or products to which it refers.

This Product Stewardship Summary is intended only to provide a general summary of the potential hazards associated with the product or products described herein. It is not intended to provide detailed information about potential health effects and safe use and handling information and, although Axiall Corporation believes this information is correct, Axiall Corporation makes no warranties as to its completeness or accuracy. Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the Axiall Corporation product(s) mentioned in this document. Before working with any of these products, users must read and become familiar with the available information on product hazards, proper use, and handling. Information is available in several forms, such as safety data sheets (SDS) and product labels. A copy of Axiall's SDS for *Tri-Ethane* can be obtained by going to the company's website www.axiall.com.

This information is subject to change without notice.

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