Ethylene Product Stewardship Summary
(CAS number 74-85-1)

Chemical Formula for Ethylene
C2H4

What is Ethylene?
Ethylene, also known as Ethene, is a key building block for the petrochemical industry. It is a colourless, flammable gas with a slightly sweet odour and is the main product of the steam cracking of hydrocarbons such as naphtha and gas oil. In this process, the feedstock molecules are ‘cracked’ at high temperatures in the presence of steam to produce, among other things, hydrogen, ethylene, propylene, butadiene, benzene and toluene.

How is Ethylene Used?
The applications of ethylene are numerous and ethylene derivatives are traded around the world. Polyethylenes of various density and melt flow account for more than 50% of world ethylene demand. The primary use of polyethylene is in film applications for packaging, carrier bags and trash liners. Other applications include injection moulding, pipe extrusion, wire and cable sheathing and insulation, as well as extrusion coating of paper and cardboard.

Health, Safety and Environmental Considerations
At room temperature, ethylene is a volatile, colourless, gas. Ethylene presents a significant fire and explosion hazard based on its physical properties. Ethylene is extremely flammable and reactive. Direct contact with liquefied ethylene can cause frostbite-like burns to the eyes and skin. Ethylene is an asphyxiant therefore it can displace oxygen resulting in an oxygen-deficient atmosphere. Symptoms of exposure to high levels of petroleum gas asphyxiants include shortness of breath, dizziness, incoordination and confusion but the effects are fully reversible if exposure stops. Additionally, exposure to vapours may cause dizziness and drowsiness.

The ACGIH has adopted 200 ppm Time Weighted Average (TWA) as the Threshold Limit Value (TLV) for the workplace and most European countries and several other countries also have a 200 ppm 8 hours TWA Occupational Exposure Limit (OEL).

The primary hazard concern, if there is a spill or leak near the general public, is a fire and/or explosion based on the extremely flammable characteristics of ethylene.

In the aquatic environment, ethylene will evaporate rapidly, followed by rapid atmospheric oxidation.
Storing and Transporting Ethylene

Ethylene is transported by pipeline and vessel. Most products are delivered directly to the customer. However, ethylene may be stored in storage tanks or underground salt wells (domes).

Risk Characterization Summary

Risks associated with exposure to this product have been evaluated for the following “chain-of-commerce” activities: manufacture, storage, product transfer, transportation, and customers/markets. It is manufactured, stored and transported to customers in closed systems. Depending on the customer, end uses may vary from use as an intermediate for the manufacture of other chemicals, commercial products, or certain formulated consumer products. Proper equipment design and handling procedures maintain low risk from exposure where used as an intermediate. Exposures may be higher in commercial and consumer applications. To minimize risk, additional controls, such as, special handling procedures and protective packaging are implemented.

This product stewardship summary is intended to give general information about the chemical or categories of chemicals addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the chemical’s applicable Safety Data Sheet, which should be consulted before use of the chemical. This product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.

Disclaimer

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