Shell Chemicals

PIPERYLENE Product Stewardship Summary

CAS number
504-60-9

Chemical formula
C5H8

What is piperylene?

Piperylene - also known as 1,3-pentadiene - is produced as part of the separation process of crude C5 materials from pyrolysis gasoline (pygas) – both by-products of ethylene manufacture. It is essentially derived from crude oil via a number of extraction steps.

How is piperylene used?

Piperylene is used as an intermediate monomer in the manufacture of plastics, adhesives and resins. Piperylene-based products are notably present in modern adhesives - such as those used in the manufacture of envelopes, parcel tapes and diaper fastenings - and across the world in road markings.

Health, Safety and Environmental considerations

Piperylene is a colourless to light-coloured liquid with an unpleasant odour. Piperylene is highly flammable and presents a significant fire and explosion hazard. Where piperylene vapours are in the air, sources of ignition should be removed.

Pure piperylene is of low acute toxicity. However, when Dicyclopentadiene (DCPD) is present as a minor component, the product is moderately toxic. Piperylene can be irritating to the eyes, skin and respiratory system. Prolonged and repeated skin contact can result in dermatitis.

The American Conference of Governmental Industrial Hygienists (ACGIH) has assigned an eight-hour occupational exposure limit of 5 parts per million (ppm) for DCPD High exposure to piperylene can cause central nervous system depression, resulting in dizziness, light-headedness, headache, nausea and loss of coordination. If swallowed, it can cause lung damage and chemical pneumonia, which can be fatal.

Piperylene is not listed as a carcinogen by international or national organisations. However, some piperylene-rich streams contain more than one per cent isoprene which is classified as a Group 2B product (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Storage and Transport

Piperylene may be shipped by barge/ship, rail, road and road. To prevent peroxide formation, which could lead to uncontrolled polymerisation when the product is transported or stored, another chemical is added to stabilise piperylene and it is stored under a non-flammable (inert) gas.

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. Due to health, safety and environmental considerations, it is only manufactured, stored and transported to customers in closed systems. Likewise, customers are limited to those who only use the product in closed systems as an intermediate for the manufacture of other chemicals. Proper equipment design and handling procedures maintain low risk from exposure to the product where the product is used as a chemical intermediate.

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 Material 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.