Butadiene
Product Stewardship Summary
(CAS number 106-99-0)

Chemical Formula for Butadiene
C4H6

What is Butadiene?
Butadiene, also known as 1,3-butadiene, is a colourless gas that condenses to a liquid at minus 40.1°F/4.5°C. Butadiene is derived, using an extractive distillation process, from the crude C4 stream, one of the cracker by-products of ethylene and propylene production.

How is Butadiene Used?
The largest single use for butadiene is in the production of styrene-butadiene rubber (SBR) which, in turn, is principally used in the manufacture of automobile tyres. SBR is also used in adhesives, sealants, coatings and in rubber articles like shoe soles. Polybutadiene is also used in tyres and can be used as an intermediate in the production of acrylonitrile-butadiene-styrene (ABS). ABS is widely used in items such as telephones, computer casings and other appliances.

Other polymers made from butadiene include styrene-butadiene latex, used for example in carpet backings and adhesives; nitrile rubber, used in hoses, fuel lines, gasket seals, gloves and footwear; and styrene-butadiene block copolymers which are used in many end-uses ranging from asphalt modifiers (road and roofing construction applications), to adhesives, footwear and toys.

Chemical intermediates made from butadiene include adiponitrile and chloroprene which are used, respectively, in the manufacture of nylon and neoprene.

Health, Safety and Environmental Considerations
Direct contact with liquefied butadiene can cause frostbite-like burns to the eyes and skin. Inhaling high concentrations of butadiene gas may cause dizziness, headache and nausea.

International agencies like the International Agency for Research on Cancer (IARC) regard butadiene as a human carcinogen. Butadiene is also classified as a mutagen. In the work environment, the Occupational Exposure Limit (OEL) for butadiene globally ranges from 1 - 2 ppm 8-hour Time Weighted Average (TWA). A short-term Exposure Level (STEL) of 5 ppm has been set by Occupational Safety and Health Administration (OSHA) and a few other countries.

In the aquatic environment, butadiene will evaporate rapidly, followed by rapid atmospheric oxidation.
Automobile exhaust fumes and other forms of combustion or burning are sources of butadiene being released to the atmosphere. Due to the compound’s presence in the atmosphere, the general population is exposed to low levels (parts per billion range) of butadiene through normal breathing. Under routine conditions, the contribution of butadiene from manufacturing sources is a small percentage of the total amount in the environment.

Butadiene is extremely flammable and reactive. It presents a significant fire and explosion hazard. It can spontaneously ‘polymerise’ into rubber.

**Storing and Transporting Butadiene**

Butadiene is transported by pipeline, rail car and barge/vessel. To prevent peroxide formation, which could lead to uncontrolled polymerisation when the product is transported or stored, another chemical is added as an inhibitor and the product 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. 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 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.

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