

## ISOPRENE

This Product Safety Summary document is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, or to provide a discussion of all safety and health information. This document is not intended to replace the Material Safety Data Sheet.

### 1. Chemical Identity

Isoprene is an olefin stream, generally manufactured from feedstocks that are of "petroleum" origin in a petroleum refinery or chemical plant as part of the catalytic cracking or steam cracking processes. Isoprene is a hydrocarbon characterized as di-olefin, because of its 2 double bonds. It has 5 carbon atoms and is an isomer of pentadiene. Typically it is available in a high purity (>99%).

CAS No. 78-79-5

Isoprene

Other Names: 2-methyl-1,3, butadiene

Isoprene also occurs in nature; it is formed naturally in low quantities in animals (including humans).

### 2. Product Uses

Isoprene is primarily used as a feedstock to manufacture other industrial chemicals. Most high purity Isoprene is used to manufacture polymers, such as polyisoprene, styrenic thermoplastic elastomer block copolymers, and butyl rubber. In addition, Isoprene is used to manufacture certain specialty chemicals which are then used to make other products. Natural rubber is a (natural) polymer of isoprene.

### 3. Physical / Chemical Properties

Isoprene is highly flammable. At ambient temperature and pressure, Isoprene is a liquid, but it readily evaporates to its gaseous form.

Isoprene is a very reactive chemical because of its double olefinic bond. This allows it to undergo chemical reactions under selective and controlled conditions. It is typically only handled in industrial facilities where safe conditions regarding ignition sources and ventilation are adequately controlled. The flash point for Isoprene is <-54°C.

### 4. Health Information

In an occupational setting, the primary route of exposure to Isoprene is through inhalation. Isoprene is generally believed to have low acute toxicity at the levels found in the workplace. At high airborne concentrations, isoprene is an asphyxiant (the level of oxygen available to breathe is reduced); high exposures can also lead to drowsiness and dizziness and may cause central nervous system depression, irritation to the eyes, nose throat and lungs.

### 5. Additional Hazard Information

In certain animal studies, exposure to Isoprene resulted in mutations and cancer in laboratory animals. The relevance of these findings to humans is uncertain.

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### 6. Food Contact Regulated Uses

Isoprene is not claimed as compliant for food contact uses.

### 7. Environmental Information

In the environment, Isoprene entering aquatic and terrestrial habitats will rapidly partition to the air because it exerts a higher vapor pressure. In the air, Isoprene has the potential to degrade rapidly through physical processes with an estimated half-life of approximately 1 hour. Although Isoprene has been shown to produce acute aquatic toxicity in standard tests with closed systems that maintain constant exposures, it is unlikely that these concentrations would be maintained in the environment due to its volatility. Any residual Isoprene remaining in aquatic or terrestrial habitats will also be subject to rapid biodegradation based on standard testing results. Because the tendency of Isoprene is to migrate from water and soil to air, residual concentrations in aquatic and terrestrial habitats will be short lived and chronic toxicity is not expected.

### 8. Exposure Potential

Based on the uses for Isoprene, the public could be exposed through:

- **Workplace exposure** – This refers to potential exposure to Isoprene in a manufacturing facility or industrial workplace. Generally, exposure of personnel to Isoprene in manufacturing facilities is relatively low because the process, storage and handling operations are closed, with little potential for releases to the air. ExxonMobil recommends limiting occupational exposure to no more than 10 parts per million (ppm) as a time-weighted average over an 8-hour work day. Since Isoprene is used in a closed process, exposures are unlikely to approach these levels.
- **Consumer use of products containing Isoprene** – Isoprene is not sold to the general public. Exposure to consumers would be expected to be extremely low, far below the recommended occupational exposure level described above.
- **Environmental releases** – As a chemical manufacturer, we are committed to operating in an environmentally responsible manner everywhere we do business. Our efforts are guided by in-depth scientific understanding of the environmental impact of our operations, as well as by the social and economic needs of the communities in which we operate. Industrial spills or releases are rare; however a spill or release may pose a significant flammability issue. Our operational improvement targets and plans are based on driving incidents with real environmental impact to zero and delivering superior environmental performance.

### 9. Manufacture of Product

- **Capacity** – Publicly available sources indicate that total world Isoprene consumption was reported as over 700,000 metric tons in 2004.
- **Process** – Isoprene is manufactured as part of catalytic cracking processes or steam cracking processes in chemical plants or petroleum refineries.

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### 10. Risk Management

If Isoprene is (inadvertently) released during use, avoid breathing the gas. Use non-sparking tools and explosion-proof equipment. Make sure that there is adequate ventilation. Always strictly use protective, chemical resistant gloves to protect your hands and skin and always wear eye protection such as chemical goggles and a face shield. Do not eat, drink, or smoke where Isoprene is handled, processed, or stored.

Isoprene is a volatile organic compound (VOC). Considerable measures are taken to prevent its release to the atmosphere. Processes and equipment for manufacture, transfer and storage are continuous and enclosed.

### 11. Federal/Science Agency Resources (For CAS No. searches, enter 78-79-5)

Organization for Economic Cooperation and Development (OECD) - ChemPortal web-based search tool

- <http://webnet3.oecd.org/echemportal/>

European Chemical Substances Information System (ESIS)

- <http://ecb.jrc.it/esis/>

U.S. Environmental Protection Agency - High Production Volume Information System (HPVIS)

- <http://www.epa.gov/hpv/>

New Jersey Hazardous Substance Fact Sheet

- <http://nj.gov/health/eoh/rtkweb/documents/fs/1069.pdf>

### 12. Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of Isoprene. These regulations may vary by city, state, country or geographic region.

### 13. Conclusion Statements

- Isoprene is a widely used industrial chemical used to make other industrial chemicals. It is not sold to the general public.
- Isoprene, in its pure form, can give a high level of concern for toxicity to health based on its potential to cause asphyxiation.
- Isoprene is not expected to cause adverse environmental effects at levels typically found in the workplace or environment.
- Isoprene is extremely flammable; use in closed systems, and only with good ventilation and avoid all ignition sources.

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