

Global Product Strategy (GPS) Safety Summary

Methanol

This GPS Safety Summary 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, nor to provide an overview of all safety and health information. This summary is not intended to replace the Safety Data Sheet. For detailed guidance on the use or regulatory status of this substance, please consult the Safety Data Sheet and the Product Stewardship Bulletin (PSB).

Chemical Identity

Name: Methanol
Brand names: Methanol
Chemical name (IUPAC): Methyl Alcohol
CAS number: 67-56-1
EC number: 200-659-6
Molecular formula: CH₄O

Uses and Applications

Methanol is an important component in the production of many consumer products.

The largest use of methanol is in the production of other chemicals such as acetic acid, formaldehyde, methyl methacrylate, methylamines, chloro-methanes and olefins. These materials are then used to produce many products such as plastics, synthetic fibers, paints, adhesives insulation, carpeting, refrigerants, pigments and dyes.

The fastest growing segment of the methanol marketplace is in fuels due to its high octane rating compared to gasoline. Methanol is used to manufacture methyl tert-butyl ether, which is no longer marketed in the U.S. as a fuel additive but is still in use in other countries. Methanol is finding increased use in the transesterification of triglycerides to yield biodiesel fuel.

Due to methanol's rapid biodegradation it is used in wastewater treatment facilities to provide a carbon food source for denitrifying bacteria, which remove nitrates.

Methanol is also used as a solvent, denaturant for ethanol and as an antifreeze and windshield washer fluid.

Physical / Chemical Properties

At ambient temperature methanol is a colorless liquid with a faint, alcohol odor that is detectable at 160 parts per million of air (ppm). The substance is of low molecular weight and is considered to

be highly flammable. The flash point for methanol is 9.7°C (49.5°F). The boiling and freezing points of Methanol are 65°C (149°F) and -98°C (-144°F) respectively.

Methanol has been classified as hazardous under GHS (Globally Harmonized System on Classification and Labeling) for its high flammability.

Health Effects

Methanol has been classified as hazardous under GHS for acute toxicity, single exposure target organ toxicity and developmental and lactation toxicity.

The table below gives an overview of the health effects assessment results for methanol.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Acutely toxic via the oral, dermal and inhalation routes of exposure. Toxicologically significant central nervous system effects, blood (acidosis), and ophthalmic effects have been reported in humans accidentally or intentionally exposed by ingestion, inhalation or skin exposure.
Irritation / corrosion Skin / eye/ respiratory tract	Not irritating to skin but may cause mild eye irritation.
Sensitization	Not a sensitizer.
Toxicity after repeated exposure Oral / inhalation / dermal	Low concern for repeated exposure toxicity.
Genotoxicity / Mutagenicity	Low concern for mutagenicity/genotoxicity.
Carcinogenicity	Not considered to be a human cancer concern.
Toxicity for reproduction	Not toxic to fertility. May damage the unborn child, and may cause harm to breast-fed children.

Environmental Effects

Methanol has very low toxicity to aquatic life and has accordingly not been classified under GHS as hazardous.

The table below gives an overview of the environmental assessment results for methanol.

Effect Assessment	Result
Aquatic Toxicity	Very low toxicity to aquatic life

Fate and behaviour	Result
Biodegradation	Rapidly biodegradable
Bioaccumulation potential	Not expected to bioaccumulate
PBT / vPvB conclusion	Not considered to be either PBT nor vPvB

PBT = Persistent, Bio-accumulative and Toxic in the environment.
vPvB = very Persistent and very Bio-accumulative in the environment.

Exposure

Human health

When using a methanol containing consumer product at home, all instructions and precautions should be read, understood and followed. Adequate ventilation should be provided and it should never be used near open flames or other ignition sources.

Workers may be exposed to methanol during activities such as product transfer, packing and repacking, formulation, laboratory activities, or during use as a component in professional or industrial products. For such activities, exposure should be controlled by selecting and applying the appropriate Risk Management Measures.

Exposure to methanol in manufacturing facilities where methanol is used as a chemical intermediate is considered low because the process, storage and handling operations are enclosed. However, worker exposure can potentially occur during operations such as product transfer, product sampling, or maintenance / repair activities on product containing systems. The risk of accidental exposure should be controlled by selecting and applying the appropriate Risk Management Measures.

Environment

Methanol is manufactured in a closed and automated process. Transfer (loading and transport) of methanol is conducted with dedicated equipment in dedicated containers to prevent any release from the system.

Risk Management Measures

For detailed guidance on the use of methanol, the Safety Data Sheet and the Product Safety Bulletin should be consulted.

Methanol should be handled only by knowledgeable and trained personnel.

Flammability

Because of its flammability potential, methanol should not be handled or stored near heat, sparks or flame. Metal containers involved in the handling and storage of this material should be grounded and bonded.

Human health

When using chemicals make sure that there is adequate ventilation. Always use appropriate chemical-resistant gloves to protect your hands and skin, always wear eye protection such as chemical goggles and always wear flame-retardant clothing. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If the substance gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention.

In the case of transfer or maintenance operations, always clear transfer lines prior to decoupling, and flush/drain to a closed system for recycle prior to opening equipment.

In cases where engineering controls cannot maintain airborne substance concentrations below exposure limits, or in cases with a risk of accidental exposure, additional risk management measures may be necessary for safe use, such as the use of a complete suit protecting against chemicals and supplied air, a self-contained breathing apparatus or respirator.

Environmental

In case of accidental release or spill, do not allow the product to enter sewers, surface or ground water.

Regulatory Information / Classification and Labeling

This substance has been registered under REACH by relevant companies of LyondellBasell in the European Union.

For a detailed overview of the regulatory status of this substance, please refer to the Product Stewardship Bulletin which is available from the LyondellBasell corporate website.

Under GHS (Globally Harmonized System on Classification and Labeling) substances are classified according to their physical, health and environmental hazards. The hazards are communicated via specific labels on the product packaging and the Safety Data Sheet. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

For a detailed overview of the classification and labeling of this substance, please refer to the regional Safety Data Sheet, which can be found on the LyondellBasell corporate website.

Conclusion Statements

- Methanol is used to produce components of many consumer products, including plastics, paints, carpeting, antifreeze and fuels.
- Methanol has been classified as hazardous. The main hazards are high flammability, acute toxicity via oral, dermal and inhalation exposure routes, single exposure target organ toxicity, and hazardous to the unborn and breast-feeding child.
- Exposure of workers and the environment is considered very low as the Methanol manufacturing process, storage and handling operations are enclosed.

Contact Information within Company

For further information on this product in general, please consult the LyondellBasell corporate website (www.lyb.com).

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Disclaimer

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LyondellBasell prohibits or restricts the use of its products in certain applications. For further information on restrictions or prohibitions of use, please contact a LyondellBasell representative.

Users should review the applicable Safety Data Sheet before handling the product.

Methanol is a product of LyondellBasell Acetyls, LLC