HUNTSMAN

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PRODUCT SAFETY SUMMARY:
PROPYLENE CARBONATE

This Product Safety Summary is intended to provide a general description of certain Huntsman chemical substances and products containing the chemical substance(s). The information in this Summary is not intended to replace the information included on the Safety Data Sheet (SDS), Product Safety Label, and other safe use and handling literature for the chemical substance(s).

Chemical Identity:

Name	Other Identifiers
Propylene carbonate	1,2-Propylene carbonate 1,2-Propanediol carbonate 1-Methylethylene carbonate 4-Methyl-1,3-dioxolan-2-one

General Product Overview:

Propylene carbonate is a reactive intermediate or component with widespread sector of end use of article (i.e. manufacture of fine chemicals, scavenger, laboratory agent). Manufactured or used by Huntsman for industrial downstream users or professionals.

Applications and Uses:

Propylene carbonate is used at industrial site as non-reactive processing aid or reactive process regulator in polymerization processes. Manufactured or formulated in the chemical industry in closed batch processes by mixing or blending, without or with occasional controlled exposure. Use at industrial site in “as such” form or leading to inclusion into/onto article.

Physical and Chemical Properties:

Propylene carbonate is colorless liquid. Certain physical/chemical properties specific to propylene carbonate are summarized below:

Physical/Chemical Property	Result
Molecular Weight	102.09 g/mol
Melting point	-49 °C
Boiling point	242 °C

Physical/Chemical Property	Result
Density	1.2 x 10^3 kg/m^3 at 20°C
Partition coefficient (Log Kow)	-0.41 at 20°C
Vapour Pressure	0.06 hPa at 25 °C
Water Solubility	200 g/L at 25°C
Flash point	116°C
Viscosity	2.76 mPa·s at 20°C
Flammability	Not classified
Explosiveness	Non-explosive
Oxidizing property	Non-oxidizing

Additional physical and chemical property information is available on the product Safety Data Sheet (SDS), which can be requested at SDS@huntsman.com.

Human Health Information:

The probability of experiencing health effects associated with exposure to propylene carbonate is controlled, provided the recommendations stated in the Safety Data Sheet are enforced. Adverse health effects are subject to dose level, route, and duration of exposure.

Different regulatory classification criteria apply in different geographic regions. These different criteria may result in different human health regulatory classifications for the same product in different geographic regions. Specific regulatory classification information is contained in the Safety Data Sheet for each product in use in a specific geographic region. The acute and chronic health effects information set forth below is based on GHS criteria.

All instructions found on the packaging should be followed. Propylene carbonate is safe when used appropriately. The uses identified for the substance have been assessed as safe under several regulatory programs.

Summary – Human Toxicological data:

Effect Assessment	Result
Acute Toxicity: Oral	LD_{50}> 2000 mg/kg
Acute Toxicity: Dermal	LD_{50}> 2000 mg/kg
Skin Irritation	Non-corrosive to the skin

Effect Assessment	Result
Eye Irritation	Causes eye irritation. Cat. 2
Sensitization	Non-sensitizer
Genotoxicity	Non-mutagenic
Neurotoxicity	Not determinable

Propylene carbonate is classified under the UN GHS classification criteria. More information can be obtained in the Safety Data Sheet.

Acute Health Effects:

Likelihood/frequency of oral, skin and inhalation exposures are low, if used under strictly recommended conditions and closed process.
Acute oral toxicity of propylene carbonate is low. The oral LD_{50} for rats was determined to be > 2000 mg/kg. Based on the LD_{50} and the criteria of the CLP Regulation, the test item is not classified for acute oral toxicity.

It's not possible to derive a long-term exposure for local effects after oral exposure.

Propylene carbonate does not indicate skin irritation and skin sensitization and is considered to be non-corrosive.

According to the criteria laid down in the CLP Regulation, propylene carbonate is classified as an eye irritant substance category 2 (irritating to eyes) as the mean redness score is 2 at 24, 48 and 72 hours in 2 of the 3 animals tested and the effects are fully reversible within 10 days.

Summary - Ecotoxicological Data:

Effect Assessment	Result
Short term toxicity to aquatic invertebrates	EC_{50} value > 1000 mg/L
Short term toxicity to fish	LC_{50} value > 1000 mg/L
Toxicity to aquatic microorganisms	EC_{50} for freshwater algae > 929 mg/L EC10 for freshwater bacterium = 7400 mg/L

Propylene carbonate was found to pose no hazard to aquatic species including *Daphnia Magna*, algae *Desmodesmus subspicatus* and bacterium *Pseudomonas putida*.

Summary - Environmental fate and pathways:

Effect Assessment	Result
Ready biodegradability	Readily biodegradable

Propylene carbonate is readily biodegradable. Due to this property and the low octanol water partition coefficient (log Pow=-0.41), the substance is not expected to bioaccumulate or cause secondary poisoning. No bioaccumulation is expected based on the low log Kow (log Pow= -0.41) and the property of readily biodegradability of the substance.

The closed process in which the product is used does not lead to direct emissions to soil and air. Procedural and/or control technologies are used to minimize emissions and potential exposure during cleaning and maintenance activities.

Occupational (workers) Exposure:

At Huntsman, propylene carbonate is manufactured in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions. During normal operating conditions, occupational exposure to propylene carbonate is not expected in the manufacturing process. Procedural and/or control technologies are used to minimize exposure during sampling, cleaning, maintenance, or in more open handling systems. Appropriate engineering controls (such as ventilation) and personal protective equipment should be used in accordance with the exposure guidelines and workplace practices identified in the Safety Data Sheet.
Workers working with propylene carbonate in industrial operations could be exposed during maintenance, sampling, testing, or other procedures. Workplace exposure is controlled and minimized by use of proper occupational handling procedures and personal protection and safety equipment. Potential routes of worker exposure to propylene carbonate are through dermal contact and to a minor extent, through inhalation in a propylene carbonate manufacturing facility or in the various industrial facilities that use propylene carbonate. Ingestion is not an anticipated route of exposure. Worker exposure can occur in industrial facilities where the substance is produced or formulated into end-use products. Within this assessment, both industrial workers and trained professionals are evaluated. The exposure has been assessed as safe if the substance is used as directed on the label, avoiding splashes onto skin and into eyes. Huntsman follows and recommends customers to follow workplace exposure guidelines through a variety of industrial hygiene and ventilation measures. The substance has been assessed as safe for professional and industrial use, when the provisions identified in the SDS are followed carefully.

Likelihood/frequency of skin and inhalation exposure is low, due to its usage under strictly controlled conditions and closed process. Also, no combined exposure of workers is expected as there are no consumer uses for propylene carbonate, while exposure during service life is

negligible.

Consumer Exposure:

Huntsman does not market propylene carbonate directly for consumer use.

There are no consumer uses for propylene carbonate, although some dermal exposure from the service life is expected. A very low residual release during the service life of articles. Hence, oral and inhalation exposure are considered not relevant, while dermal exposure can be considered as negligible. Further, it is recommended to keep propylene carbonate away from the reach of children and avoid direct contact.

Environmental exposure:

Propylene carbonate is readily biodegradable and not harmful to aquatic organisms. Conclusively, all identified uses are safe for the environment based on the scientific facts and when carried out in compliance with recommended risk management measures and applicable regulations.

Regulatory Information/Classification and Labeling:

Regulations exist that govern manufacture, sales, transportation, use and disposal of propylene carbonate. These regulations may vary by city, state, country, or geographic region. Information can be found by consulting the relevant SDS.

Under the Globally Harmonized System (GHS) for Hazard Communication, substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the Safety Data Sheets. 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. The hazard statements and symbols presented here refer to the hazard properties of the concentrated substance and are meant to provide a brief overview of the substance's labeling. It is not intended to be comprehensive or to replace information found in the Safety Data Sheet.

Labeling according to GHS:

Hazard pictograms	
Signal word	Warning
Hazard statements	H319: Causes serious eye irritation.

Note: The hazard statements and symbols presented here refer to the hazard properties of the concentrated substance and are meant to provide a brief overview of the substance's labeling. It is not intended to be comprehensive or to replace information found in the Safety Data Sheet.

References:

- Information on registered substance (ECHA): https://echa.europa.eu/registration-dossier/-/registered-dossier/16088.

Additional Information:

Information on registered substances is available on the European Chemicals Agency (ECHA) website at https://echa.europa.eu.

Disclaimer

The information and recommendations in this publication are, to the best of our knowledge, information and belief, accurate at the date of publication. NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity, and behavior of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity, and behavior should be determined by the user and made known to handlers, processors, and end users.

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