RESONAC

GPS/JIPS Safety Summary

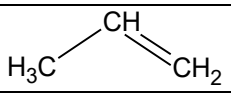
1. SUBSTANCE NAME

Propylene (CAS No.: 115-07-1)

2. GENERAL STATEMENT

Propylene is a source material for producing polypropylene, from which automotive components, packaging films, food containers, trays, medical utensils and other plastic products that are often encountered in our daily lives have been made. The substance takes the form of a clear gas under normal temperatures, and possesses a slight aroma. It is a typical basic petrochemical product produced together with ethylene, by thermally decomposing naphtha made from crude oil at temperatures of 800°C or higher. As an organic compound with a double bond, it is used as a basic source material for polypropylene, acrylonitrile, acrylic acid and other propylene products. On the other hand, the gas is extremely combustible and flammable. As such, it is important to keep it away from heat, sparks, open flames and other fire sources. Additionally, note that its inhalation could induce drowsiness and dizziness.

3. CHEMICAL IDENTITY

Item	Description
Chemical or generic name	Propylene
Trade name	Propylene
Synonyms	Propene
CAS No.	115-07-1
Other No.	Japan: Chemical Substances Control Law (2)-13 Japan: Industrial Safety and Health Act, existing chemical substance
Chemical Formula	C_3H_6
Structual Formnula	
Source/References	Section 3 of the SDS issued by Resonac Corporation

4. USES AND APPLICATIONS

Main uses	It is used as a raw material for petrochemical products such as polypropylene, acrylonitrile, acrylic acid, and propylene oxide. Polypropylene is widely used as a synthetic resin with many excellent properties such as light weight, processability, durability, heat resistance, and chemical resistance for automotive bumpers, instrument panels, food trays, home appliances, and medical devices.

5. PHYSICAL/CHEMICAL PROPERTIES

At room temperature, it is a colorless, extremely flammable gas with a faint sweet aromatic odor.

Appearance	Gas
Colour	Colourless
Odour	Hydrocarbon-like odor, aromatic odor
Melting point/Boiling point	-185.2 – -184.3 ℃ / -48 ℃ (at 760 mmHg)

Flash point	< −56 ℃(Closed cup)
Flammability (solid, gas)	Highly flammable gas
Explosive limits (vol %)	2.4 – 10.3 vol %
Auto-ignition temperature	455 ℃
Vapour pressure	10201 hPa (at 20 ℃)
Relative vapour density at 20 ℃	No data available
Relative density	0.5139 g/cm^3 (at 20 ℃)
Solubility in water	No data available
Partition coefficient n-octanol/water (Log Pow)	1.77
Sources/references	Section 9 of the SDS issued by Resonac Corporation

6. HEALTH EFFECTS

When inhaled, the gas could induce drowsiness and dizziness.

Effect assessment	Results （GHS Hazard Classification）
Acute toxicity (oral)	Classification not possible
Acute toxicity (dermal)	Classification not possible
Acute toxicity (inhalation:gas)	Not classified
Acute toxicity (inhalation:vapour)	Not applicable
Acute toxicity (inhalation:dust,mist)	Not applicable
Skin corrosion/irritation	Classification not possible
Serious eye damage/eye irritation,	Classification not possible
Respiratory sensitisation	Classification not possible
Skin sensitisation	Classification not possible
Germ cell mutagenicity	Classification not possible
Carcinogenicity	Classification not possible
Reproductive toxicity	Classification not possible
Specific target organ toxicity — Single exposure,	Category 3 (Narcosis) May cause drowsiness or dizziness.
Specific target organ toxicity (repeated exposure)	Classification not possible
Aspiration hazard	Not applicable
Referencese	Section 2 and 11 of SDS issued by Resonac Corporation

・ GHS (Globally Harmonized System of Classification and Labelling of Chemicals): A system that classifies chemicals according to the type and degree of hazards, labels the information, and provides safety data sheets according to globally harmonized rules.
・ Not applicable: Since the priority of physical state, chemical structure, chemical property, and hazard items used in the GHS classification procedures does not fall under the category, it is not subject to the classification for the category.
・ Not classified: Sufficient information has been obtained to implement the GHS classification, and as a result of the classification, it does not fall under any of the hazard categories specified in the GHS.
・ Classification not possible : There is not enough information for GHS classification, and classification is not possible.

7. ENVIRONMENTAL EFFECTS

Effect assessment	Results （GHS Hazard Classification）
Hazardous to the aquatic environment, short-term (acute)	Classification not possible
Hazardous to the aquatic environment, long-term (chronic)	Classification not possible

Hazardous to the ozone layer	Classification not possible
Sources/references	Sections 12 of the SDS issued by Resonac Corporation

Environmental fate/dynamics	
Mobility in soil	Koc=445、219-237
Persistence/degradability	Biodegradability test (4 weeks) Persistent Biodegradability test (BIOWIN ver4.10) Rapid degradability
Bioaccumulation potential	BCF=13.18 Bioaccumulation potential is presumed to be low.
Conclusion about PBT/vPvB	The criteria for persistent bioaccumulative and toxic (PBT; remaining persistently in the environment and possessing high bioaccumulation potential and toxicity) and very persistent and very bioaccumulative (vPvB; remaining very persistently in the environment and possessing very high bioaccumulation potential) chemicals are believed to inapplicable.
Sources/references	Sections 12 of the SDS issued by Resonac Corporation

8. EXPOSURE

Detals	Exposure potentials through main uses
Occupational exposures	Since the company's product is produced in a closed process, the potential for occupational exposure is extremely limited. Polypropylene, propylene oxide and other products made from the substance are manufactured in closed processing systems. As such, exposure to workers who manufacture polypropylene and propylene oxide, etc., is extremely limited. However, workers could inhale the substance, or their skin and eyes could come in direct contact with it when sampling, etc.
Consumer exposures	The substance is not used in any case by general consumers.
Environmental exposures	Since the substance is normally manufactured and used in a closed process, its emission into the environment is extremely limited. The substance exists in the form of gas under normal temperatures and pressures, and is believed to be dispersed in the air when discharged into the environment. Further, the substance could be promptly decomposed in the air.
Precautions	If there is a possibility of exposure in other uses, take appropriate measures with reference to recommended risk management measures.

9. RISK MANAGEMENT RECOMMENDATIONS

Recommended risk management measures can minimize risks to workers, consumers, and the environment from Section 8 exposure scenarios.

Detals	Risk management recommendations
Worker	Wear appropriate protective masks, as well as clothes and protective gloves made of materials impermeable to propylene, when sampling the substance. The American Conference of Governmental Industrial Hygienists (ACGIH) has published the occupational threshold limit value of 500 ppm (time-weighted average; TWA) for this substance. Therefore, in manufacturing places or places using the substance, it is required to manage and control an environmental concentration of the substance

	to keep it below the threshold limit value. Managers responsible for processes should educate workers on the selection of appropriate protective gear, their proper usage and how to manage their working places.
	Precautions The operation manager should educate operators about the selection of appropriate protective equipment, proper usage method, and control method of the work site.
Consumer	Normally, this substance is not used by general consumers, but if it is used, the same risk management measures as those for "workers" above should be taken.
Enviaronment	The substance could affect the environment if leaked. Therefore, implement preventive measures against leakage and pay attention to the daily management and handling of the substance.
Special notes (emergency measures in case of leakage, etc.)	Keep away from heat, sparks, open flames, high-temperature objects and other fire sources, because the substance is extremely combustible and flammable. Wear conductive shoes that prevent static electricity while at work. When ethylene manufacturing facilities are open (for regular repair, etc.), oxygen shortage could result when the atmospheric concentration of ethylene is high. Measure the oxygen concentration before entering the area, and wear appropriate protective gear as necessary.
Precautions	For normal handling, emergency response, disposal, and transportation control measures, refer to sections 4, 5, 6, 7, 8, 13, and 14 of the SDS issued by Resonac Corporation.

10. STATE AGENCY REVIEW

Hazard assessment	Situations of review
International Chemical Safety Cards	International Chemical Safety Card https://www.ilo.org/dyn/icsc/showcard.display?p_card_id=0559&p_edit=&p_version=2&p_lang=en
OECD HPV	High production volume chemical testing programme https://hpvchemicals.oecd.org/UI/Search.aspx
NITE-CHRIP（NITE Chemical Risk Information Platform）	https://www.nite.go.jp/en/chem/chrip/chrip_search/srhInput
GHS Classification Results by the Japanese Government	NITE - Chemical Management Field - GHS Information

11. REGULATORY INFORMATION／GHS CLASSIFICATION AND LABELLING INFORMATION

Regulatory information only in Japan

Applicable laws	Regulatory situations
Industrial Safety and Health Act	Dangerous or Harmful Substances Subject to Be Indicated their Names（Article 57 Paragraph (1) of the Act, Article 18 item(ⅰ) and item(ⅱ) appended Table No. 9 of the Enforcement Order） propene Dangerous Substances：flammable gas（appended table1 item 5 of Enforcement Order）

	Other flammable substances that are gaseous at a temperature of 15℃ and 1 atmospheric pressure Dangerous Articles and Harmful Substances Whose Names, etc. Should Be Notified(Article 57-2 of the Act, Article 18-2 item(ⅰ) and item(ⅱ) appended Table No. 9 of the Enforcement Order) propene
Poisonous and Deleterious Substances Control Act	Not applicable
Ship Safety Act	High-pressure gas, flammable high-pressure gas （Article 2 and 3 of Regulations for the Carriage and Storage of Dangerous Goods in Ship, Cabinet Order Concerning the Control of Hazardous Materials appended Table 1）
Civil Aeronautics Act	High-pressure gas, （Article 194 of the Enforcement Ordinance, Cabinet Order Concerning the Control of Hazardous Materials appended Table 1）
Port Regulations Act	Hazardous materials(inflammable liquids) （Article 20-2 of the Act, Article 12 of Enforcement Ordinance, Notification of the Enforcement Regulations of the Port Regulations Act specifying the types of hazardous materials)
Road Act	Restrictions on vehicle traffic(Article 19-13 of the Enforcement Ordinance, Appended Table 2 of Notification No.12 of Japan Expressway Holding and Debt Repayment Agency) propyle
High Pressure Gas Safety Act	Liquefied gas (Article 2-3 of the Act) Liquefied gas Flammable gas (Article 2-1 of the General High-pressure Gas Safety Regulations) propyle
Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (Law concerning Pollutant Release and Transfer Register / PRTR)	Not applicable
UN classification	2.1
UN No.	UN1077 PROPYLENE

Hazards	Classification results (hazard information)
Physical hazards	Flammable Gas Category 1
	Gases under pressure, Liquefied gas
Health hazards	Specific target organ toxicity (single exposure) Category 3, Narcosis

Labelling Information	
Hazard pictograms (GHS)	

Signal word (GHS)	Danger
Hazard statements (GHS)	Extremely flammable gas (H220) Contains gas under pressure; may explode if heated. (H280) May cause drowsiness or dizziness. (H336)

12. CONTACT INFORMATION

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13. DATE OF ISSUE / REVISION, ADDITIONAL INFORMATION

Date of issue: September 27, 2013

Revisions:

Date of revision	Revised section	Revised item	Version
January 10, 2023	6, 9, 10-13	Update to the latest information	Rev.2

The contents are based on the safety data sheet (SDS) created on January 10, 2023.

Special instructions: none

14. DISCLAIMER

The safety summary is part of the effort for the voluntary management of chemical substance in the chemical industry (GPS/JIPS: Japan Initiative of Product Stewardship). The purpose of the safety summary is to provide information on the safe handling of the product as an overview and not to provide professional information, such as the risk evaluation process and its impact on human health and the environment. This document is not meant to serve as an alternative to risk evaluation, such as a Safety Data Sheet (SDS) or a Chemical Safety Report (CSR). This safety summary is being written as accurately as possible based on data such as laws, materials, and information available at the time of publication, but it does not include all data. It does not guarantee anything.