

Product name	CAS No.	UN No.	EU No.
Propane	74-98-6	1978	200-827-9

### 1. Product and company identification

- a) Product name Propane
- b) Recommended use of the chemical and restrictions on use
- Recommended use of the chemical Residential & Commercial, fuel, refrigerant, petrochemical raw material
  - Restrictions on use No Data Available
- c) Manufacturer / Supplier Information
- Name SK GAS
  - Address ECO Hub, SK Chemicals Complex, 332, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
  - Emergency phone number 82-2-6200-8245 (A person in charge: Manager Myoung Han No)

### 2. Hazards identification

- a) Hazard-Risk Classification
- Physical Hazards Flammable gases category 1A  
Gas under pressure (Liquefied gas)  
Gas under pressure (Refrigerated liquefied gas)
- Health Hazards Specific target organ toxicity (single exposure) category 3 (anesthesia)
- Environmental Hazards Not applicable

b) Label elements including precautionary statements

- Symbol



- Signal word

Danger

- Hazard-risk statement

(H220) Extremely flammable gas  
(H280) Contains gas under pressure; may explode if heated  
(H281) Contains refrigerated gas; may cause cryogenic burns or injury.  
(H336) May cause drowsiness or dizziness.

- Precautionary statement

Prevention

(P210) Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
(P282) Wear cold insulating gloves and either face shield or eye protection.  
(P261) Avoid breathing fume/gas.  
(P271) Use only outdoors or in a well-ventilated area.

Response

(P377) Leaking as fire: Do not extinguish, unless leak can be stopped safely.  
(P381) In case of leakage, eliminate all ignition sources.  
(P336+P317) Immediately thaw frosted parts with lukewarm water. Do not rub affected area. Get medical help.  
(P304+P340) IF INHALED: Remove person to fresh air and keep comfortable from breathing.  
(P319) Get medical help if you feel unwell.

Storage

(P403) Store in a well-ventilated place.  
(P410+P403) Protect from sunlight. Store in a well-ventilated place.  
(P403+P233) Store in a well-ventilated place. Keep container tightly closed.

Disposal

(P405) Store locked up.  
(P501) Dispose of contents/container to in accordance with local/regional/national/international regulations.

c) Other Hazard. Risk which are not included in the classification criteria

- Propane	
Health	0
Flammability	4
Reactivity	0

### 3. composition / information in ingredients

Chemical name	Other name	CAS 번호	Content (mol%)
Propane	Propane	74-98-6	95 ~ 100%
Butane	Butane	68513-65-5	0 ~ 5%
Ethane	Ethane	74-84-0	0 ~ 5%

\* The product is not a mixture of several single substances and the components listed are constituents of a single substance.

### 4. First aid measure

a) Eye contact	Seek medical attention immediately.
b) Skin contact	Seek medical attention immediately  In case of contact with liquefied gas, melt the affected area with lukewarm water.  Before removing frozen clothes from the skin, defrost. In the case of burns, immediately cool the area with cold water for as long as possible, and do not remove clothing that sticks to the skin. If on skin, wash with plenty of soap and water.  If skin irritation occurs, get medical advice/attention.
c) Inhalation	Seek medical attention immediately.  Keep the affected person warm and at rest.  Move to a place with fresh air.  If breathing is difficult, give oxygen.  If breathing has stopped, perform mouth-to-mouth resuscitation.
d) Ingestion	Seek medical attention immediately.
e) Notes for physician	Ensure that medical personnel are aware of the substance and take protective measures.

### 5. Fire-fighting measures

a) Suitable (and unsuitable) extinguishing	CO <sub>2</sub> , dry chemical, water spray or fog for surrounding area.  Use dry sand or earth for the smothering extinguishment
b) Specific hazards arising from the chemical	
Risks for fire or explosion	Extreme flammable gas
Hazardous substances generated during combustion	Vapor may cause dizziness or asphyxiant without awareness
NFPA flammability rating	4

- c) Special protective equipment and precautions for fire-fighters
- Be careful as some leave a flammable residue after evaporation.
  - In case of a leaky gas fire, do not try to extinguish the fire unless the leak can be stopped safely.
  - Remove all sources of ignition if possible to handle safely.
  - Rescuers should wear appropriate protective gear.
  - Get out of the area and keep a safe distance to extinguish.
  - Be careful as liquefied gas vapor is heavier than air and spreads along the ground.
  - Move containers from fire area if it is not hazardous.
  - Be careful as a damaged cylinder may fly off.
  - Block access by unauthorized persons, isolate hazardous area and deny entry.
  - Do not pour water directly to an exposure source or safety device as it may freeze in case of tank fire.
  - In case of tank fire, extinguish at maximum distance or use unmanned fire extinguishing equipment.
  - In the event of a tank fire, immediately back off if there is a high-pitched sound or discoloration of the tank.
  - In case of tank fire, step away from the tank.
  - Evacuate according to the accident situation.  
(Evacuation radius: 0.8km, the spread varies depending on the accident location and countermeasures)

## 6. Accidental release measures

- a) Personal precautions, protective equipment and emergency procedures
- Stop leak if not hazardous.
  - Eliminate all ignition sources.
  - Be aware of substances and conditions to avoid.
  - Isolate contaminated area until gas is fully diffused and diluted.
  - Do not touch the exposed material or walk around as it can break easily.
  - Do not enter unless required or without protective equipment.
  - Wipe up spills immediately and follow precautions in protective equipment section.
  - If possible, turn the leakage container to release gas rather than liquid.
  - Ventilate the contaminated area.
  - Do not flush directly into the leak source.
  - Do not allow water to come into contact with spillage by reducing vapors using water spray or by dispersing vapor clouds.
  - Always ground all equipment when handling material
- b) Environmental precautions and protective procedures
- Atmosphere: Avoid release to the environment.
  - Soil: Avoid release to the environment.
  - Water: Prevent entry into waterways, sewers, basements, and confined spaces.
- c) Methods and materials for containment
- Small spills: Absorb spills from inert substances (such as dry sand or soil), and place in a chemical waste container.
  - Large spills: Build dikes for fire extinguishing and collect water.

### 7. Handling and storage

- a) Precautions for safe handling
- Do not handle until all safety precautions have been read and understood.
  - Handle only outdoors or in a well-ventilated area.
  - Work with reference to engineering controls and personal protective equipment.
  - Be sure to ground all equipment when handling material.
  - Be aware of substances and conditions to avoid.
  - Do not apply pressure, cut, weld, solder, bond, puncture, abrade, or expose to heat, flame, sparks, static electricity, or other sources of ignition.
  - Follow all MSDS/label precautions as product residue may remain after container is emptied.
  - Avoid prolonged or prolonged skin contact.
  - Wash the affected area thoroughly after handling.
  - Avoid breathing gas/vapours.
- b) Conditions for safe storage  
(including any incompatibilities)
- Keep away from heat, spark and flame – No Smoking.
  - Avoid direct sunlight and store in a well-ventilated place.
  - The empty cylinder should be completely drained, properly blocked and immediately returned to the cylinder regulator. Place it properly.
  - Do not expose the container to heat as pressure may rise when exposed to heat.
  - Store in a cool, well-ventilated area.
  - Be aware of substances and conditions to avoid.

### 8. Exposure controls and personal protection

a) Control parameter and Biological Exposure Indices

KOSHA

Propane	TWA: 1,000ppm
Butane	TWA: 800ppm
Ethane	Not applicable

ACGIH

Propane	TLV-TWA: 1,000ppm
Butane	TLV-TWA: 1,000ppm
Ethane	TLV-TWA: 1,000ppm

OSHA

Propane	PEL-TWA: 1,000ppm PEL-STEL: 1,800ppm
Butane	Not applicable
Ethane	Not applicable

NIOSH

Propane	REL-TWA(10hr): 1,000ppm REL-STEL: 1,000ppm
Butane	Not applicable
Ethane	Not applicable

Biological exposure standard                      Not applicable

b) Appropriate engineering controls	Facilities storing or using this material should be equipped with eyewash facilities and safety showers. Manage ventilation facilities to be below the allowable concentration, and install explosion-proof ventilation if there is a risk of explosive concentration.
c) Personal protective equipment	
- Respiratory protection	If there is a possibility of direct contact or exposure to the substance, wear appropriate Korea Occupational Safety and Health Agency authorized respirator.
- Eye protection	If there is a possibility of direct contact or exposure to the substance, wear appropriate Korea Occupational Safety and Health Agency authorized goggles.
- Hands protection	If there is a possibility of direct contact or exposure to the substance, wear appropriate Korea Occupational Safety and Health Agency authorized gloves for chemicals.
- Body protection	If there is a possibility of direct contact or exposure to the substance, wear appropriate Korea Occupational Safety and Health Agency authorized protective clothing for chemicals.

### 9. Physical and chemical properties

a) Appearance	
- Color	Colorless
- Physical state	Gas, liquid at low temperature, high pressure
b) Odor	Odorless (before injecting an odorizer), Characteristic odor (after injecting an odorizer)
c) Odor threshold	The odor of gas shall be detected when the gas/air compound ratio reaches 1/1000. (after injecting an odorizer)
d) pH	Not applicable
e) Melting /freezing point	about -187.68 ~ -180°C
f) Initial boiling point and boiling range	about -44 ~ -40°C
g) Flash point	about -106 ~ -100°C
h) Evaporation rate	Not available
i) Flammability (liquid, gas)	Flammable gas
j) Upper / lower flammability	about 9.5% / about 2.1%
k) Vapor pressure	about 8 Bar (at 21°C)
l) Solubility	about 62mg/L (at 25°C)
m) Vapor density	about 1.55 (air=1)
n) Specific gravity	about 0.508 (at 15°C)
o) Partition coefficient (n-octanol / water)	about 2.36
p) Autoignition temperature	About 430°C (The Lowest temperature of all substance)
q) Decomposition temperature	Not available
r) Viscosity	Not available
s) Molecular weight	About 44.2

### 10. Stability and reactivity

a) Chemical stability and possibility of hazardous reactions	<p>Extreme Flammable gas.</p> <p>Contains high pressure gas; may explode when heated.</p> <p>Forming an explosive mixture with air.</p> <p>Container may explode when heated.</p> <p>Easily ignited by heat, sparks, and flames.</p> <p>Vapor can flash back by moving to the ignition source.</p> <p>Steam can cause dizziness or suffocation without awareness.</p> <p>Some substances can be irritating when inhaled at high concentrations.</p> <p>Cylinder exposed to fire can release flammable gas.</p> <p>Heat decomposition or combustion may produce irritating and highly toxic gases during burning.</p> <p>Be careful as some leave a flammable residue after evaporation.</p>
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|-------------------------------------|--|
| b) Conditions to avoid              | Keep away from strong oxidizers, ignition sources and heat – no smoking.                       |
| c) Incompatible materials           | Not available  |
| d) Hazardous decomposition products | Heat decomposition or combustion may produce irritating and highly toxic gases during burning. |

### 11. Toxicological information

a) Information on the likely routes on exposure

- |  |                      |
|--|----------------------|
| - Inhalation through the respiratory tract | May cause anesthesia |
| - Ingestion through the mouth              | Not available        |
| - Skin contact                             | Not available        |
| - Eye contact                              | Not available        |

b) Health hazards information

- Acute toxicity

- |         |  |
|---------|--|
| Oral    | The product is classified as 'Not classified'. |
| Propane | Not available                                  |
| Butane  | Not available                                  |
| Ethane  | Not available                                  |

Dermal

- |         |  |
|---------|--|
|         | The product is classified as 'Not classified'. |
| Propane | Not available                                  |
| Butane  | Not available                                  |
| Ethane  | Not available                                  |

Inhalation

- |         |  |
|---------|--|
|         | The product is classified as 'Not classified'. |
| Propane | ATE: 1,237mg/L 2hr Mouse                       |
| Butane  | Not available                                  |
| Ethane  | ATE: 1,237mg/L 2hr Mouse                       |

- Skin corrosion / irritation

- |         |  |
|---------|--|
|         | The product is classified as 'Not classified'. |
| Propane | Not available                                  |
| Butane  | Not available                                  |
| Ethane  | Category 2                                     |

- Eye damage / irritation

- |         |  |
|---------|--|
|         | The product is classified as 'Not classified'. |
| Propane | Not available                                  |
| Butane  | Not available                                  |
| Ethane  | Category 2                                     |

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- Respiratory sensitization	The product is classified as 'Not classified'.
Propane	Not available
Butane	Not available
Ethane	Not available
- Skin sensitization	The product is classified as 'Not classified'.
Propane	Not available
Butane	Not available
Ethane	Not available
- Carcinogenicity	The product is classified as 'Not classified'.
Propane	Not available
Butane	Not available
Ethane	Not available
- Germ cell mutagenicity	The product is classified as 'Not classified'.
Propane	Not available
Butane	Not available
Ethane	Not available
- Reproductive toxicity	The product is classified as 'Not classified'.
Propane	Not available
Butane	Not available
Ethane	Not available
- Specific target organ toxicity (single exposure)	As the total content of Category 3 ingredients is more than 20%, the substance corresponds "Specific target organ toxicity (single exposure) category 3 (anesthesia)"
Propane	Category 3 (anesthesia)
Butane	Category 3 (anesthesia)
Ethane	Category 3 (anesthesia)

- Specific target organ toxicity (repeated exposure)	The product is classified as 'Not classified'.
Propane	Not available
Butane	Not available
Ethane	Not available

- Aspiration hazard	The product is classified as 'Not classified'.
Propane	Not available
Butane	Not available
Ethane	Not available

## 12. Ecological information

### a) Aquatic hazard

- Acute	
Propane	LC50 (4days): 24.11-147.54mg/L (Fish)
Butane	LC50 (48hr): 17.133mg/L (Daphnia magna)
Ethane	LC50 (4days): 24.11-147.54mg/L (Fish)

### - Chronic

Propane	Not available
Butane	Not available
Ethane	Not available

### b) Persistence and degradability

- Persistence	log Kow: 2.36 (Propane), 2.89 (Butanes), 1.81 (Ethane)
- Degradability	Not available

### c) Bioaccumulative potential

- Biodegradation	65.7% 35day (Propane, Butanes, Ethane)
- Bioaccumulative potential	BCF: 13 (Propane)

### d) Mobility in soil

Not available

### e) Other adverse effects

#### - Hazard to the Ozone layer

Propane	Not applicable
Butane	Not applicable
Ethane	Not applicable

#### - Others

Not available

**13. Disposal considerations**

- |                        |  |
|------------------------|--|
| a) Disposal method     | All disposal practices must be in compliance with all laws and regulations with elimination of the risk of explosion.  |
| b) Disposal precaution | Beware of fire and explosion hazards due to residual gas in the container like cylinder or tank<br>Disposal should be in accordance with applicable regional, national and local laws and regulations. |

**14. Transport information**

- |  |                   |
|--|-------------------|
| a) UN number   | 1978              |
| b) UN proper shipping name   | PROPANE           |
| c) Transport hazard class(es)  | 2.1               |
| d) Packing group, if applicable  | No Data Available |
| e) Environmental hazards   | No Data Available |
| f) Special precaution which a user to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises |                   |
| - emergency procedures in a fire   | F-D               |
| - emergency procedures with the gas leak   | S-U               |

**15. Regulatory information**

- |  |                               |
|--|-------------------------------|
| a) Industrial Safety and Health Act                                |                               |
| - Chemical needs monitoring workplace exposure limit :             | Not applicable                |
| - Harmful agents subject to workers requiring health examination : | Not applicable                |
| - Chemical specified the exposure limit :                          | Not applicable                |
| - Chemicals subject to permissible exposure limit :                | Not applicable                |
| - Prohibited chemicals :   | Not applicable                |
| - Hazardous substances requiring management :                      | Not applicable                |
| - Substance for PSM :  | Applicable (Propane, Ethane)  |
| b) Chemical Control Act  |                               |
| - Poisonous substances :   | Not applicable                |
| - Authorized chemicals :   | Not applicable                |
| - Restricted substances :  | Not applicable                |
| - Toxic Release Inventory(TRI) Chemicals :                         | Not applicable                |
| - Prohibited substances:   | Not applicable                |
| - Accident Precaution Chemicals :                                  | Not applicable                |
| c) Dangerous Material Safety Control Act                           | Not applicable                |
| d) Wastes Management Act (domestic)                                | Designated waste(Propane)     |
| e) Other requirements in domestic and other countries              |                               |
| - Water quality and aquatic ecosystem conservation act :           | Not applicable                |
| - Clean air conservation act :                                     | Not applicable                |
| - POPs Management Law :  | Not applicable                |
| - Information of EU Classification                                 |                               |
| Classification   | F+; R12 (Propane, Ethane)     |
| Risk Phrases   | R12 (Propane, Ethane)         |
| Safety Phrase  | S2, S9, S16 (Propane, Ethane) |

- U.S. Federal regulations	
OSHA PROCESS SAFETY (29CFR1910.119) :	Not applicable
CERCLA Section 103 (40CFR302.4) :	Not applicable
EPCRA Section 302 (40CFR355.30) :	Not applicable
EPCRA Section 304 (40CFR355.40) :	Not applicable
EPCRA Section 313 (40CFR372.65) :	Not applicable
- Rotterdam Convention listed ingredients :	Not applicable
- Stockholm Convention listed ingredients :	Not applicable
- Montreal Protocol listed ingredients :	Not applicable

## 16. Other information

### a) Information source and references

1. National Chemicals Information System, National Institute of Environmental Research (NCIS)
2. Hazardous Substances Data Bank (HSDB)
3. National Library of Medicine(NLM)
4. Chemical Carcinogenesis Research Information System (CCRIS)
5. Chemicals the Screening Information Dataset (SIDS)
6. International Chemical Safety Cards(ICSC)
7. Canadian Centre for Occupational Health and Safety(CCOHS)
10. U.S. Environmental Protection Agency(EPA): ECOTOX(ECOTOxicology) database
11. National Emergency Management Agency
12. MSDS, Korea Occupational Safety and Health Agency
13. UNECE - Globally Harmonized System of Classification and Labelling of Chemicals(GHS)
14. Integrated Risk Information System(IRIS)
15. Concise International Chemical Assessment Documents (CICADs)
16. Environmental Health Criteria Monographs (EHCs)
17. Health and Safety Guides (HSGs)
18. Exposure criteria for chemicals and physical factors (Notice No. 2020-48 of the Ministry of Employment and Labor)
19. Act on The Control, ETC. of Manufacture of Specific Substances for the Protection of the Ozone Layer
20. Commission Regulation (EU) No 2015/1221

b) First Date Created 2010-06-16

### c) Revision number and date

Number of revisions 8 / 2021.09.28 (update on MSDS form, toxicity and Hazards identification, regulations)

### d) Others

No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.