

SDS of C4-LPG (Raffinate-2)

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1. Identification of the substance and of the supplier

- 1.1 Trade Name** : C4-LPG (Raffinate-2)
1.2 Molecular Formula : Not available
1.3 Manufacturer /Import : Bangkok synthetics Company Limited
1.4 Address : 5, I-7 Rd. Maptaphut Industrial Estate, Muang District, Rayong 21150
Phone number : (+66) 3869 8698
Fax : (+66) 3869 8699
Emergency Phone number : (+66) 3869 8601 (Mutual Aid Coordinator Center)
1.5 Relevant identified uses of the substance or mixture and uses advised against : Not available
1.6 Identified uses : Used as a domestic, commercial, industrial and automotive

2. Hazards Identification

2.1 Classification of the mixture according to Globally Harmonized System (GHS) standards (GHS hazard statements and category)

Physical Hazard :

Flammable gas Category 1
Gases under pressure

Health Hazard :

Carcinogenicity Category 1A
Germ cell mutagenicity Category 1B

Environmental Hazard :

Not available

Others hazard :

Not available

2.2 GHS label elements

Hazard Pictogram :



Signal Word :

Danger

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Hazard Statement :

- H220 Extremely flammable gas
- H280 Contains gas under pressure; may explode if heated
- H340 May cause genetic defects
- H350 May cause cancer

Precautionary Statement :

- P203 Obtain, read and follow all safety instructions before use.
- P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.
- P222 Do not allow contact with air.
- P280 Wear protective gloves/protective clothing/eye protection/face protection
- P318 If exposed or concerned, get medical advice.
- P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
- P381 In case of leakage, eliminate all ignition sources.
- P403 Store in a well-ventilated place.
- P405 Store locked up.
- P501 Dispose of contents/container

2.3 There hazards which do not result in classification : Not available

3. Composition/ Information on Ingredients

- 3.1 Chemical type (Substance/Mixture) : Mixture
- 3.2 Chemical identity : Petroleum gases, liquefied
- 3.3 Common name and synonym : Not available
- 3.4 CAS number : 68476-85-7
- 3.5 EC number : 270-704-2
- 3.6 Impurities and stabilizing additives : Not available

3.7 Ingredient :

ส่วนประกอบสารเคมี	CAS No.	EC No.	% โดยน้ำหนัก
Petroleum gases, liquefied (LPG)	68476-85-7	270-704-2	≤100%

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4. First Aid Measures

4.1 Description of first aid measures

Skin : In case frostbite, do not remove clothing. IMMEDIATELY wash affected areas gently with water for at least 20 minutes while removing and isolating all contaminated clothing. If symptoms such as inflammation or irritation develop, IMMEDIATELY go to a hospital for treatment.

Eyes : Remove contact lenses if present. Flush with water or normal saline solution for 20 to 30 minutes. Do not put any ointments, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

Inhalation : IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital.

Ingestion : If this chemical has been swallowed, get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued exposure may result in unconsciousness and/or death.

Potential Chronic health effects : No known significant effects or critical hazards

4.3 Indication of any immediate medical attention and special treatment needed Notes to : Treat symptomatically. Administer oxygen if necessary.

5. Fire Fighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media : Use water spray, alcohol-resistant foam, dry chemical or Carbon Dioxide.

Unsuitable Extinguishing Media : Not available

5.2 Special Exposure Hazards :

Hazardous from Fire and Explosion :

- EXTREMELY FLAMMABLE.
- Will be easily ignited by heat, sparks or flames.

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- Will form explosive mixtures with air.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Vapors may travel to source of ignition and flash back.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

Hazardous De-Combustion Products : Carbon monoxide may be evolved if incomplete combustion occurs. Unidentified organic and inorganic compounds. Sustained fire attack on vessels may result in a Boiling Liquid Expanding Vapour Explosion (BLEVE). Contents are under pressure and can explode when exposed to heat or flames. The vapour is heavier than air, spreads along the ground and distant ignition is possible

5.3 Advice for Firefighters

Special Fire-Fighting Procedures :

- DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.
- If it can be done safely, move undamaged containers away from the area around the fire.
- Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks in direct contact with flames.
- For massive fire, use unmanned master stream devices or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Special Protective Equipment for Firefighters : Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

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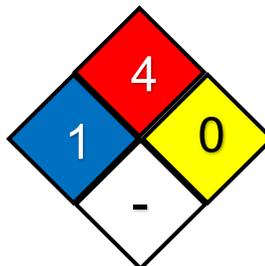
5.4 NFPA 704 Diamond

Health hazard (Blue) : 1

Fire hazard (Red) : 4

Reactivity (Yellow) : 0

Specific hazard (White) : -



5.5 Fire and explosion protection : Keep tank cool by spraying with water

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures :

- Evacuate area.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.
- Do not direct water at spill or source of leak.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.

6.2 Environmental precautions : Try to stop release. Prevent from entering sewers, basements and work pits, or any place where its accumulation can be dangerous.

6.3 Methods and materials for containment and cleaning up : Not available

6.4 Spill Management : C4-LPG (Raffinate-2) is a waste chemical stream constituent which may be subjected to ultimate disposal by controlled incineration.

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7. Handling and Storage

7.1 Precautions for safe handling : This product can create a low temperature exposure hazard when released as a liquid. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Avoid prolonged or repeated contact with skin. Electrostatic charges may be generated during handling. Electrostatic discharge may cause fire. Earth all equipment. Use local exhaust ventilation if there is risk of inhalation of vapors, mists or aerosols.

7.2 Conditions for safe storage, including any incompatibilities : Store only in purpose-designed, appropriately labeled pressure vessels or cylinders. Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat. Do not store near cylinders containing compressed oxygen or other strong oxidizers.

8. Exposure Controls/ Personal Protection

8.1 Control parameters

TLV-TWA (ACGIH) : 1,000 ppm (1800 mg/m³)

REL-TWA (NIOSH) : 1000 ppm (1800 mg/m³)

PEL-TWA (OSHA) : 1000 ppm (1800 mg/m³)

IDLH (NIOSH) : 2000 ppm [10% LEL]

8.2 Personal protective equipment

Respirators : Where air filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for organic gases and vapors. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.

Skin : Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact ect. Neoprene rubber. Nitrile rubber. If contact with liquefied product is possible or anticipated, gloves should be thermally insulated to prevent cold burns.

Eyes : Chemical splash goggles (gas-tight mono goggles) and face shield.

Other Protection : Impervious clothing. Flame retardant antistatic protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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8.3 Appropriate engineering controls : Use sealed process system. Proper ventilation or control airborne concentrations below the exposure guidelines/limits (LEL). Use explosion proof ventilation equipment. All electronic equipment should have grounded and conforms to standard.

9. Physical and chemical properties

9.1 General information Appearance

Physical State : Liquid under pressure

Color : Colorless

9.2 Odor : slight odor

9.3 Odor threshold limit : Not available

9.4 pH : Not available

9.5 Melting point : -187.6 - -138.3 °C.

9.6 Freezing point : -187.6 - -138.3 °C.

9.7 Boiling point : -161.5 - -0.5 °C.

9.8 Flash point : -104 - -60 °C.

9.9 Evaporation rate : Not available

9.10 Flammability (solid, gas) : Extremely flammable

9.11 Lower Flammability/Explosive limits (LFL/LEL) : 5%

9.12 Upper Flammability/Explosive limits (UFL/UEL) : 15%

9.13 Vapor pressure : 380 - 840 kPa.

9.14 Vapor density : 540 kg/m³

9.15 Relative density : 0.54

9.16 Solubility : Insoluble in water.

9.17 Partition coefficient : n-octanol/water : Not available

9.18 Auto-ignition temperature : 287 - 537 °C.

9.19 Decomposition temperature : Not available

9.20 Viscosity : Not available

9.21 Molecular Weight : Not available

9.22 Specific gravity : Not available

9.23 Surface Tension : Not available

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10. Stability and reactivity

10.1 Reactivity : Not available

10.2 Chemical stability : Stable

10.3 Possibility of hazardous reactions : No hazardous reaction is expected when handled and stored according to provisions.

10.4 Condition to avoids : Heat, open flames, sparks and flammable atmospheres.

10.5 Incompatible materials : Strong oxidising agents.

10.6 Hazardous decomposition products : Hazardous decomposition products are not expected to form during normal storage.

11. Toxicological information

11.1 Information on toxicological effects

Eyes : May cause mechanical irritation (abrasion).

Skin : Not available

Inhalation : Low toxicity: LC50 >20 mg/l, 4.00 hr, Rat High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.

Ingestion : Not available

11.2 Potential Chronic health effects : No known significant effects or critical hazards

11.3 Routes of Entry : Inhalation, Dermal

11.4 Acute toxicity

11.4.1 LD50

Oral (mg/kg) : Not available

Dermal (mg/kg) : Not available

11.4.2 LC50

Inhalation (ppm, mg/m³) : Not available

11.5 Carcinogenicity/Germ cell mutagenicity (GHS or IARC) : Not available

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12. Ecological Information

12.1 Eco-Toxicity : Physical properties indicate that petroleum gases will rapidly volatilise from the aquatic environment and that acute and chronic effects would not be observed in practice

12.2 Persistence and Degradability : Expected to be readily biodegradable. Oxidises rapidly by photo-chemical reactions in air.

12.3 Bioaccumulative potential : Not expected to bioaccumulate significantly.

12.4 Mobility in soil : Because of their extreme volatility, air is the only environmental compartment that hydrocarbon gases will be found.

12.5 Other adverse effects : Not available

13. Disposal considerations

13.1 Waste and safe handling information : Not available

13.2 Waste treatment methods : It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods compliance with applicable regulations. Return part-used or empty cylinders to the supplier.

13.3 Contaminated containers/Packages : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. Transport information

14.1 UN number : 1965

14.2 UN proper shipping name : HYDROCARBON GAS MIXTURE, LIQUEFIED
(LPG)

14.3 Transport hazard class : 2.1

14.4 Packing group : Not available

14.5 Marine pollutant : Not available

14.6 Transport in bulk according to annex II of MARPOL73/78 and the ICB code : Not available

14.7 Special precautions : Not available



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14.8 Further information : Not available

15. Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1 Thailand Regulation

Ministry of Labour : Notification of the Department of Labour Protection and Welfare:
Occupational Exposure Limits for Hazardous Chemicals (3 August 2017)

Ministry of Industry : Hazardous Substance Act, B.E. 2535 (1992)

Ministry of Public Health : Not available

Ministry of Natural Resources and Environment : Not available

Ministry of Transport : Not available

Further information : Not available

15.1.2 Federal and State Regulations (Foreign country) :

EINECS : All components listed or polymer exempt.

OSHA : Not available

TSCA : All components listed.

SARA : Not available

EU REACH (EC Regulation 1907/2006)

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006 : Material is listed on REACH.

Substances in Candidate List (Art. 59 REACH) : Material is not listed

Substances subject to authorization (Annex XIV REACH) : Material is not listed

16. Other information

16.1 Manufacturer's Recommendation : Users of the chemical shall conduct a comprehensive risk assessment of all production processes or activities involving the substance to identify and control potential hazards to personnel, property, and the environment. Appropriate preventive and control measures shall be implemented and maintained throughout all stages of handling, including transportation, storage, use, and final disposal.

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16.2 References :

1. <https://www.chemtrack.org/Chem-Detail.asp?ID=t0127&NAME=Liquified%20petroleum%20gas>
2. <https://www.erg4thai.com/web/#/guide/search/1124>
3. <https://cameochemicals.noaa.gov/chemical/987>
4. <https://cameochemicals.noaa.gov/chemical/873>
5. <https://cameochemicals.noaa.gov/chris/LPG.pdf>

16.3 Key or legend to abbreviations and acronyms used in the safety data sheet :

ACGIH : American Conference of Government Industrial Hygienists

NFPA : National Fire Protection Agency

NIOSH : National Institute for Occupational Safety & Health

OSHA : Occupational Safety & Health Administration

IARC : International Agency for Research on Cancer

SARA : Superfund Amendments and Reauthorization Act.

GHS : Globally Harmonized System

TSCA : Toxic Substance Control Act

WHMIS: Workplace Hazardous Materials Information System

LD50 : Lethal Dose 50%

CNS : Central Nervous System NTP National Toxicology Program

EC50 : Effective Concentration NOAEL No Observable Adverse EffectLevel

EC50 : Effective Concentration 50% NOEC No Observed Effect Concentration

PEL : Permissible Exposure Limit

STEL : Short-term Exposure Limit

TLV : Threshold Limit Value

TWA : Time Weighted Average

16.4 Further information : Ensure operators understand the flammability hazard. Ensure all nation/local regulations are observed. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.