R-600a

Safety Data Sheet

R600a ISOBUTANE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ISOBUTANE
OTHER NAME: 2-methylpropane
USE: Refrigerant Gas

IN CASE OF TRANSPORTATION EMERGENCY CALL:

CHEMTREC: 1-800-424-9300

EMERGENCY OVERVIEW:
Flammable gas. Liquid under high pressure.

2. HAZARDS IDENTIFICATION

CLASSIFICATION: **Flammable Gas, Gas under pressure, Compressed Gas**
SIGNAL WORD: **DANGER**
HAZARD STATEMENT(S): **Extremely flammable gas, Contains gas under pressure, may explode if heated**
SYMBOL(S): **Flames, Gas Cylinder**

PRECAUTIONARY STATEMENT(S):

Prevention: Keep away from heat, sparks, open flame, and hot surfaces. No Smoking
Response: Leaking gas fire: Do not extinguish unless leak can be stopped immediately. Eliminate all ignition sources if safe to do so.
Storage: Protect from sunlight, store in a well ventilated place.

EMERGENCY OVERVIEW:
Flammable gas. Liquid under high pressure.

POTENTIAL HEALTH EFFECTS
Effects of Overexposure:

Eye Contact
Liquid can cause severe irritation, redness, tearing, blurred vision, and possible freeze burns.

Skin Contact
Contact with evaporating liquid can cause frostbite.

Inhalation

Inhalation of vapor may produce anesthetic effects and feeling of euphoria. Prolonged overexposure can cause rapid breathing, headache, dizziness, narcosis, unconsciousness, and death from asphyxiation, depending on concentration and time of exposure.

Ingestion

Aspiration Hazard!

3. COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT
Liquefied Petroleum Gas	75-28-5	100

COMMON NAMES and SYNONYMS

Isobutane; R600a

There are no impurities or stabilizers that contribute to the classification of the material identified in Section 2

4. FIRST AID MEASURES

SKIN:

For liquid contact, warm areas gradually and get medical attention if there is evidence of tissue damage. Flush area with plenty of water.

EYES:

For liquid contact, irrigate with running water for minimum of 15 minutes. Consult physician immediately if frostbite occurs.

INHALATION:

Remove to fresh air. If breathing has stopped, restore breathing at once. Administer oxygen and get medical help.

INGESTION:

Do not induce vomiting. Contact a physician immediately.

ADVICE TO PHYSICIAN: No special instructions

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT (METHOD):	-117 F (Open Cup)
UPPER EXPLOSIVE LIMIT (vol.) gas in air):	8.4%
LOWER EXPLOSIVE LIMIT (vol.) gas in air):	1.8%
EXTINGUISHING MEDIA:	Dry Chemical Extinguisher (B-C), Water

UNUSUAL FIRE HAZARDS:

Vapors are heavier than air and may travel along the ground or may be moved by ventilation systems and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, static discharge, or other ignition sources at locations distant from material handling point.

FIRE FIGHTING PROCEDURES:

Stop the release of materials if possible. Cool the vapor space of the storage container with water spray. Avoid accumulation of unburned materials. Remove personnel in general area. Observe maximum isolation when extinguishing fire. Expansion of liquid and change of state from liquid to vapor will allow combustible mixture to encompass a large area.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Avoid sources of ignition-Ventilate area. Use water fog to evaporate or ventilate. Protect body against contact with liquid. If confined space – Use self-contained breathing apparatus. Consult local fire authorities.

7. HANDLING AND STORAGE

NORMAL HANDLING:

Comply with state and local regulations covering liquefied petroleum gases. Comply with NFPA Pamphlet #58.

STORAGE RECCOMENDATIONS:

Store small containers in well-ventilated areas, away from heat or sources of ignition. Prohibit smoking in areas of storage or use.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

VENTILATION

Mechanical: Provide as needed to keep concentration in air below TLV and LEL
Local Exhaust: Continuous ventilation recommended
Special: Explosion proof fans and motors

SKIN PROTECTION:

Impervious, insulated gloves recommended. Impervious clothing for prolonged or repeated contact

EYE PROTECTION:

Face shield or goggles recommended

RESPIRATORY PROTECTION:

NIOSH approved self-contained breathing apparatus in confined areas

EXPOSURE GUIDELINES

(Exposure Limits)

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Liquefied Petroleum Gas		1000 ppm	

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless liquefied gas
PHYSICAL STATE:	Gas at ambient temperature
ODOR:	Sweet petroleum odor
SOLUBILITY IN WATER @ 70 Deg. F	0.008%
BOILING RANGE:	10.9˚F

VAPOR PRESSURE @ 70 Deg. F:	31 psig
FLASH POINT:	-85˚C (-18˚F)
EVAPORATION RATE:	> 1 (Ethyl Ether = 1.0)
FLAMMABILITY:	Extremely flammable in the presence of ignition sources or oxidizing materials
LEL/UEL:	1.8% / 8.4%
PARTITION COEFFICIENT n-OCTANOL/WATER:	Log Pow: 2.8
AUTO IGNITION TEMPERATURE:	460˚C / 860˚F
DECOMPOSITION TEMPERATURE:	Data not available
VISCOSITY:	Not applicable
VAPOR DENSITY (air = 1.00):	2.006
% VOLATILES BY VOLUME:	100%
DENSITY:	gas 0.5572 lb / cu ft
pH:	Not applicable
MELTING POINT:	-160˚C / -256˚F
SPECIFIC GRAVITY (H2O=1.00):	0.564
MOLECULAR FORMULA:	C_4H_{10}
MOLECULAR WEIGHT:	58.14

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY:
This product is stable

REACTIVITY: Not reactive under normal conditions.

INCOMPATIBILITY WITH OTHER MATERIALS:
None

CONDITIONS TO AVOID:
High Heat, Sparks & Open Flames

11. TOXICOLOGICAL INFORMATION

Rat inhalation LC50 (4 hr.): 658,000ppm

POTENTIAL HEALTH EFFECTS

Effects of Overexposure:

Eye Contact
Eye contact with the rapidly evaporation liquid may cause frostbite.

Skin Contact
Skin contact with the rapidly evaporation liquid may cause frostbite. Frostbite effects are a change in color of the skin to gray or white, followed by blistering.

Inhalation
Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Inhalation of high vapor concentration may cause dizziness, disorientation, incoordination, narcosis, nausea or vomiting, leading to unconsciousness, cardiac irregularities, or death.

Ingestion
Not an expected route of exposure.

DELAYED AND IMMEDIATE EFFECTS

No known significant effects or critical hazards

CARCINOGEN: Not listed by NTP, IARC, or NIOSH

12. ECOLOGICAL INFORMATION

DEGRADABILITY (BOD):
No data given

13. DISPOSAL CONSIDERATIONS

(1) Mechanical recovery
(2) Flare-Off at safe location (Vapors)
(3) Exhaust to atmosphere in safe location (No open flames)

OTHER DISPOSAL CONSIDERATIONS:
Disposal must comply with federal, state, and local disposal laws.

14. TRANSPORT INFORMATION

US DOT ID NUMBER:	UN 1969
US DOT SHIPPING NAME:	Isobutane
US DOT HAZARD CLASS:	2.1
US PDOT PACKING GROUP:	NA

15. REGULATORY INFORMATION

The ingredients listed in section 2 are reported/included in the U.S. TSCA inventory and Canadian domestics substance list.

The product is defined by OSHA in 29 CFR 1910.1200c as a flammable gas. Use of this product may require compliance with 29 CFR 1910.119, process safety management of highly hazardous chemicals.

16. OTHER INFORMATION

OTHER INFORMATION: HMIS Classification: Health – 1, Flammability – 4, Reactivity – 0

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