

# Material Safety Data Sheet

## (REFRIGERANT R600a - ISOBUTANE)

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** Isobutane

**CAS NUMBER:** 75-28-5

**CHEMICAL FAMILY:** Aliphatic hydrocarbon

**CHEMICAL FORMULA:** C<sub>4</sub>H<sub>10</sub>

**SYNONYMS:** 2-Methylpropane, Trimethylmethane

**MANUFACTURER:** NANJING REFINERY CO., LTD.

**ADDRESS:** QIXIA DISTRICT NANJING, CHINA 21033

**FAX NUMBER:** 0086 - 25 - 58986616

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**MSDS IDENTIFICATION CODE/NUMBER:** IA

### RELEVANT IDENTIFIED USES OF THE SUBSTANCE AND USES ADVISED AGAINST:

**IDENTIFIED USES:**

Not available.

**USES ADVISED AGAINST:**

Not available.

### 2. HAZARDA IDENTIFICATION

**Classification**

Hazard classes/Hazard categories	Hazard statement codes
Flam Gas 1	H220
Liquefied gas	H280

**Label elements:**

**Hazard Pictograms:**



**Signal Word(S):**

Danger

**Hazard Statement:**

H220:Extremely flammable gas

H280:Contains gas under pressure;may explode if heated

**Precautionary statement:**

P210:Keep away from heat/sparks/open flames/hot surfaces.-No smoking.

P377:Leaking gas fire:Do not extinguish,unless leak can be stopped safely.

P381:Eliminate all ignition sources if safe to do so.

P403:Store in a well-ventilated place.

P410 + P403:Protect from sunlight. Store in a well-ventilated place.

**Other hazards:**

Not available.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

INGREDIENT NAME	EXPOSURE LIMITS	CONCENTRATION PERCENT BY WEIGHT
Isobutane	No	99.0-99.9
CAS NUMBER:75-28-5	OSHA PEL -TWA:Simple Asphyxiant	

**4. FIRST AID MEASURES**

In all cases of doubt, or when symptoms persist, seek medical attention.

**In case of inhalation:**

If breathed in, move person into fresh air. Keep patient warm and at rest. If any symptoms persist obtain medical advice. If not breathing, give artificial respiration.

**In case of skin contact:**

Take off contaminated clothing and shoes. Wash off with soap and plenty of water. If skin irritation occurs: Get medical advice/attention.

**In case of eyes contact:**

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Do not use hot water. Seek immediate medical attention.

**In case of ingestion:**

Not applicable (gas).

**Most important symptoms and effects, both acute and delayed:**

The product is not classified as harmful to human health effect.

**Indication of any immediate medical attention and special treatment needed:**

Symptomatic treatment.

**5. FIRE FIGHTING MEASURES****FLAMMABLE PROPERTIES**

**FLASH POINT:** -117°F (-83°C) Closed Cup

**AUTOIGNITION:** -778°F (420°C)

**LOWER EXPLOSIVE LIMIT (%):** 1.8

**UPPER EXPLOSIVE LIMIT (%):** 8.4

**FIRE AND EXPLOSION HAZARDS.**

Isobutane is heavier than air and may travel a considerable distance to an ignition source.

Isobutane is a flammable gas! Keep away from open flame and other sources of ignition. Do not allow smoking in storage areas or when handling.

**EXTINGUISHING MEDIA**

**Suitable extinguishing media:**Water spray, foam, carbon dioxide, dry powder.

**Unsuitable extinguishing media:**water jet

**SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE:**

Extremely flammable liquefied gas. Carbon monoxide. (CO), Carbon dioxide (CO<sub>2</sub>), other hazardous substances.

## **FIRE FIGHTING INSTRUCTIONS**

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. If gas has ignited, do not attempt to extinguish but stop gas flow and allow to burn out. Use water spray to cool heat-exposed containers, and to protect surrounding areas and personnel effecting shut-off. Fire-fighters should wear self-contained breathing apparatus (SCBA) and full chemical protective clothing.

## **6. ACCIDENTAL RELEASE MEASURES**

### **Personal precautions, protective equipment and emergency procedures:**

#### **For non-emergency personnel:**

Avoid breathing gas. Ensure good ventilation. Remove all sources of ignition.

Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

#### **For emergency responders:**

Wear an appropriate NIOSH/MSHA approved respirator.

Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

#### **Methods for Containment and Cleaning up:**

Immediately contact emergency personnel. Stop leak if without risk. The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres. Where appropriate, use water spray to disperse the gas or vapour and to protect personnel attempting to stop leakage.

#### **Reference to other sections:**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for information on disposal.

**Additional information:**Not applicable.

## **7. HANDLING AND STORAGE**

### **HANDLING AND STORAGE PRECAUTIONS**

Earth bond and ground all lines and equipment associated with the product system. Electrical equipment should be non-sparking and explosion proof. Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide, or roll cylinders. Use a pressure regulator when connecting to lower pressure (250psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130°F (54°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a 'first in – first out' inventory system to prevent full cylinders from being stored for excessive periods of time.

Post "No Smoking" signs in storage or use areas.

For additional recommendations consult Compressed Gas Association pamphlet P-1.

Never carry a compressed gas cylinder or container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control parameters:

### Occupational exposure limits:

Substance	EINECS No.	CAS No.	Occupational Exposure Limit Value (8-hour reference period)		Occupational Exposure Limit Value (15-minute reference period)		
			ppm	mg/ m3	ppm	mg/ m3	Notes
Isobutane	200-857-2	75-28-5	1000	2400	-	-	-

**Additional exposure limits under the conditions of use:** Not available.

**DNEL/DMEL and PNEC-Values:** Not available.

### Exposure controls:

#### Appropriate engineering controls:

Ensure good ventilation. Handle in accordance with good industrial hygiene and safety practice.

Wash hands during breaks and at the end of the work. Avoid contact with the eyes and skin. Provide safety shower and cleaning eyes equipments.

#### Individual protection measures, such as personal protective equipment:

**Eye/face protection:** Wear chemical safety glasses.

**Hand protection:** Wear protective gloves.

**Body protection:** Flame retardant antistatic protective clothing,

**Respiratory protection:** Wear self-absorption filter respirators (half-mask).

**Thermal hazards:** Wear suitable protective clothing to prevent heat.

**Environmental exposure controls:** Avoid discharge into the environment.

According to local regulations, Federal and official regulations.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### BASIC PHYSICAL PROPERTIES

**BOILING POINT:** 10.9°F -11.7°C

**MELTING POINT:** -255.3 °F -159.6°C

**VAPOR PRESSURE:** (@70 F) 45 psia

**VAPOR DENSITY (AIR=1):** 2.06

**SOLUBILITY (H2O):** Very slight

**Odor:** A colorless, odorless gas.

## 10. STABILITY AND REACTIVITY

**STABILITY:** Stable. Avoid high temperatures. Product will start to decompose at 815°F (435°C)

### INCOMPATIBLE MATERIALS

Oxidizers

### HAZARDOUS DECOMPOSITION PRODUCTS

Carbon Dioxide and Carbon monoxide if sufficient oxygen is present.

## 11. TOXICOLOGICAL INFORMATION

**Toxicokinetics, metabolism and distribution:**

**Non-human toxicological data:**Not available

**Information on toxicological effects:**

**Acute toxicity:**

**LD50(Oral, Rat):**Not available

**LD50(Dermal, Rabbit):**Not available

**LC50(Inhalation, Rat):**1237 mg/L 2h

**Skin corrosion/Irritation:**Not classified

**Serious eye damage/Irritation:**Not classified

**Respiratory or skin sensitization:**Not classified

**Germ cell mutagenicity:**Not classified

**Carcinogenicity:**Not classified

**Reproductive toxicity:**Not classified

**STOT- single exposure:**Not classified

**STOT-repeated exposure:**Not classified

**Aspiration hazard:**Not classified

## 12. ECOLOGICAL INFORMATION

NO DATA GIVEN

## 13. DISPOSAL CONSIDERATIONS

Do not attempt to dispose of waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR GAPS SECURED AND VALVE PROTECTION CAP IN PLACE TO Advanced Gas Technologies for proper handling.

## 14. TRANSPORT INFORMATION

	Land transport (ADR/RID)	Sea transport (IMDG)	Air transport (ICAO/IAT A)
UN-Number	1969	1969	1969
UN Proper shipping name	ISOBUTANE	ISOBUTANE	ISOBUTANE
Transport hazard Class	2.1	2.1	2.1
Packaging group	Not regulated	Not regulated	Not regulated
Environmental hazards	No	No	No
Special precautions for user	See section 2	See section 2	See section 2

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not regulated	Not regulated	Not regulated
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## 15. REGULATORY INFORMATION

SARA TITLE NOTIFICATIONS AND INFORMATION

SARA TITLE - HAZARD CLASSES: Acute Health Hazard

Fire Hazard

Sudden release of Pressure Hazard

## 16. OTHER INFORMATION

NFPA HAZARD RATING – HEALTH 1 Slight Hazard

FIRE 4 Severe Hazard

REACTIVITY 0 No Hazard

MSDS IDENTIFICATION CODE/NUMBER: IA

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