

# Safety Data Sheet



## 1. Identification of the Substance/Mixture and the Supplier

Supplier : National Institute of Advanced Industrial Science and Technology (AIST)  
 Address : 1-3-1 Kasumigaseki, Chiyoda, Tokyo, Japan  
 Office in Charge : Reference Materials Office, Center for Quality Management of Metrology,  
 National Metrology Institute of Japan  
 Person in Charge : Certified Reference Material Staff  
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 Emergency Contact : Same as above

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Reference No. : 4068001

Identity of : Certified reference material NMIJ CRM 4068-a  
 Substance/Mixture : Pentane  
 Recommended Use : This reference material can be used for calibration of analysis equipment  
 and Restrictions on Use : and also used as raw material in preparation of pentane standard gas  
 which is used for natural gas composition analysis. Do not use this  
 reference material for other purposes than testing/research.  
 This CRM is a reference material (specified in the Japanese Industrial  
 Standard (JIS) Q 0030).

## 2. Hazards Identification

GHS classification : Flammable liquid : Class 1  
 Specific target organ toxicity/systemic toxicity (Single exposure) : Class 3 (Anesthetic action)  
 Aspiration hazard : Class 1  
 Toxicity to the aquatic environment (Acute) : Class 2  
 Toxicity to the aquatic environment (Long term) : Class 2

GHS label element :



Signal word : Danger  
 Hazards Statement : Extremely flammable liquid and vapor  
 May be fatal if swallowed and enters airways  
 May cause drowsiness or dizziness  
 Toxic to aquatic life with long lasting effects  
 Other Hazards Statement : May cause dry or cracked skin through repeated exposure

Precautionary Statement	<p>: [Safety Precaution]</p> <p>Keep away from ignition sources such as heat, sparks, open flames and hot surfaces. No smoking.</p> <p>Keep container tightly closed.</p> <p>Ground container.</p> <p>Use explosion-proof electrical/ventilating/lighting equipment.</p> <p>Use only non-sparking tools.</p> <p>Take precautionary measures against static discharge.</p> <p>Avoid breathing dust/fume/gas/mist/vapor/spray.</p> <p>Use only outdoor or in a well-ventilated area.</p> <p>Avoid release to the environment.</p> <p>Wear protective gloves/eye protection/face protection.</p> <p>[First-Aid Measures]</p> <p>If swallowed: Immediately call a doctor/physician.</p> <p>If on skin or hair: Remove/Take off immediately all contaminated clothing. Rinse skin with running water/shower.</p> <p>If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a doctor/physician if you feel unwell. Do not induce vomiting.</p> <p>In case of fire: Use dry sand, dry chemical extinguisher or alcohol-resistant foam to extinguish fire.</p> <p>Collect spillage.</p> <p>[Storage]</p> <p>Protect container from direct sunlight. Store in well-ventilated place at temperatures between 0 °C and 40 °C. Keep away from flames. Secure container with chains to prevent it from falling.</p> <p>[Disposal]</p> <p>Return this reference material back to the function in charge given in “1. Identification of the Substance/Mixture and the Supplier” when it becomes no longer necessary to use it or it becomes beyond its shelf life.</p> <p>The other hazards than the above do not result in classification or are not classifiable.</p>
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### 3. Composition/Information on Ingredients

Substance or mixture	:	Single substance
Chemical name	:	Pentane
Synonym	:	n-pentane
Chemical formula	:	C <sub>5</sub> H <sub>12</sub>
Molecular weight	:	72.15
CAS number	:	109-66-0
Content	:	99 % or more
Reference Number	in	Act on the Evaluation of Chemical Substances and Regulation of
Gazetted List in Japan		Their Manufacture, etc. : (2)-5
	:	Industrial Safety and Health Act :-

### 4. First-aid Measures

If inhaled	:	Remove victim to fresh air and keep at rest and warm. Get medical advice/attention.
If on skin	:	Rinse skin with clean water thoroughly. Remove/Take off all contaminated clothing, shoes, etc. If skin irritation or rash occurs: Get medical advice/attention.
If in eyes	:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
If swallowed	:	Rinse mouth with water thoroughly. Call a doctor/physician.
Expected Acute and Delayed Symptom	:	Eye/airway irritation, Central nervous system depressant effects, Narcotic effects, Dizziness, Drowsiness, Headache, Nausea, Cryogenic burn if liquid contacts with skin
Most Critical Characteristic and Symptom	:	May affect cardiovascular system and may cause functional impairment and respiratory failure. May die in case of high concentration.
Protection of First-Aid Responder	:	Wear appropriate personal protective equipment for eyes and skin as necessary.

## 5. Fire-fighting Measures

Extinguishing Media	:	In the early stages of fire, use powder, water-soluble liquid foam extinguishing agent (alcohol-resistant foam), carbon dioxide and sand.
Unsuitable extinguishing media	:	Direct water jet
Fire-Specific Hazards	:	May emit irritating or toxic fume (or gas) in case of fire.
Specific Fire-Fighting Method	:	Eliminate combustion sources at the origin of fire and put out fire by using extinguishing media. Move movable containers promptly to a safe place. If containers are immovable, cool their surroundings with water fog.
Protection of Fire-Fighters	:	Fight fire upwind to avoid breathing hazardous gas. Use personal protective equipment such as fire protection clothing, heat-resistant clothing, protective clothing, compressed air open-circuit self-contained breathing apparatus, circulating oxygen respirator, rubber gloves, and rubber boots.

## 6. Accidental Release Measures

Personal Precaution	:	Remove potential ignition sources from surrounding areas. Make fire extinguishing media/equipment available to prepare for potential ignition.
Personal Protective Equipment and Emergency Procedures	:	Ventilate the affected areas thoroughly, if it is in an indoor environment, until the clean-up operation is completed. Use appropriate personal protective equipment during the operation to avoid skin contact of splash etc. and inhalation of dust and gas.
Environmental Precautions	:	Take precautions to prevent spillage from draining into rivers etc. to adversely impact the environment. Make it sure to appropriately treat contaminated wastewater in order to prevent untreated wastewater from being released into the surrounding environment.
Recovery and	:	Collect spillage by using explosion-proof electric vacuum cleaner or wet

Neutralization	brush and store in container to dispose of it in accordance with local rules.
Prevention of Secondary Disaster	: Remove potential ignition sources from surrounding areas. Make fire extinguishing media/equipment available to prepare for potential ignition.

## 7. Handling and Storage

### Handling

Engineering Precautions	: Strict ban on fire. Use appropriate personal protective equipment in order to avoid contact on skin and inhalation of vapor.
Local and General Ventilation	: If vapor/mist is emitted: Seal the emission source and install local ventilation system.
Precautions for Safe Handling	: Avoid rough handling such as knocking over, dropping, giving a shock to and dragging container. Prevent this reference material from leaking, overflowing and splashing. Do not allow vapor to be emitted. Keep container tightly closed after using this reference material. Wash hands, face, etc. thoroughly and gargle after handling. Restrict drinking, eating and smoking to a designated area. Do not bring gloves and other contaminated personal protective equipment into staff room. Make a place handling this reference material a restricted area to keep out unauthorized people. Wear appropriate personal protective equipment to avoid inhalation and contact with eyes, skin and clothing. Use local ventilation equipment in indoor handling areas.

### Storage

Appropriate Storage Conditions	: Protect container from direct sunlight. Store in well-ventilated place at temperatures of 0 °C to 40 °C. Keep away from flames. Secure container with chains to prevent it from falling.
Incompatible Substances	: Strong oxidizers
Safe Container Packaging Material	: Use containers specified by High-Pressure Gas Safety Act and UN Model Regulations.

※ See the Certificate for the details on appropriate storage conditions and instructions for use as a reference material.

## 8. Exposure Controls/Personal Protection

Threshold Limit Value  
Not specified

Permissible Concentration (Pentane)

- ACGIH TLV-TWA : 600 ppm
- Values recommended by Japan Society for Occupational Health : 300 ppm, 880 mg/m<sup>3</sup>

Engineering Controls

Ventilation/Exhaust	: Local ventilation system or general ventilation system
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Safety Control/Gas Detection	: Measuring equipment, Detecting tube
Storage Precautions	: Ventilation along floor surface. Keep this reference material sealed. Keep away from combustible and reducing substances and strong oxidizers.
<b>Personal Protective Equipment</b>	
Respiratory System	: Gas mask against organic gas, Compressed air open-circuit self-contained breathing apparatus
Hands	: Protective gloves
Eyes	: Safety goggles
Skin and Body	: Protective clothing, Face shield
<b>Hygiene Measures</b>	
	Handle this reference material in accordance with the industrial health and safety codes.

## 9. Physical and Chemical Properties

Appearance, etc.	: Liquid
Color	: Colorless
Odor	: No data available
pH	: No data available
Melting point	: No data available
Boiling point	: 35 °C to 36 °C
Flash point	: -49.0 °C Closed cup flash test
Explosive range	: Upper limit: 8.3 vol%, Lower limit: 1.4 vol%
Vapor pressure	: 434.3 hPa (20 °C) 1394.9 hPa (55 °C)
Relative vapor density (Air=1)	: No data available
Specific gravity or bulk specific gravity	: 0.63 g/cm <sup>3</sup>
• Solubility	: Water: 0.02 mg/l (16 °C) Organic solvent: Mixed with ethanol and diethyl ether at any mixing ratios
• Partition Coefficient: n-octanol/water log Po/w	: 3.39
• Spontaneous Ignition Point	: No data available
• Decomposition Temperature	: No data available
• Combustibility	: No data available
• Coefficient of Viscosity	: 0.229 cP (20 °C)

## 10. Stability and Reactivity

Stability	: No data available
Reactivity	: No data available
Hazardous Reactivity	: No data available
Conditions to avoid	: Heat, Flames, Sparks
Incompatible materials	: Strong oxidizers

Hazardous decomposition products : Hazardous decomposition products are generated in the presence of fire  
– Carbon oxides

### 11. Toxicological information

Acute Toxicity : LD50 Oral Mouse 5000 mg/kg  
LC50 Inhalation Rat 364000 mg/m<sup>3</sup>/4 hours  
LD50 Dermal Rabbit 3000 mg/kg

Skin Corrosion/Irritation : Rabbit No skin irritation

Serious Eye Damage/ Eye Irritation : Not classifiable due to insufficient data

Sensitization - Respiratory : Not classifiable due to insufficient data

Sensitization - Skin : Not classifiable due to insufficient data

Germ Cell Mutagenicity : Ames test  
Salmonella typhimurium Negative

Carcinogenicity : IARC  
There are no substances, with their content in this reference material of 0.1% or more, for which IARC has confirmed to be “Possibly carcinogenic to humans,” “Probably carcinogenic to humans” or “Carcinogenic to humans.”

Reproductive Toxicity : Not classifiable due to insufficient data

Effects on Breast-Feeding : Not classifiable due to insufficient data

Specific Target Organ Toxicity/Systemic Toxicity (Single Exposure) : May cause drowsiness or dizziness

Specific Target Organ Toxicity/Systemic Toxicity (Repeated Exposure) : Not classifiable due to insufficient data

Aspiration Hazard : May be fatal if swallowed and enters airways

### 12. Ecological Information

Ecotoxicity : Daphnia magna EC50 = 9.74 mg/l/48 hours

Persistence and Degradability : 70 % Easily degradable

Bioaccumulation : No data available

Mobility in soil : No data available

Ozone depletion potential : No data available

### 13. Disposal Considerations

Residual Waste : Dispose of high-pressure gas in accordance with the Regulation on Safety of General High-Pressure Gas of the High-Pressure Gas Safety Act.

Contaminated Container and : Return this reference material back to the function in charge given in “1. Identification of the Substance/Mixture and the Supplier” when it becomes

Package no longer necessary to use it or it becomes beyond its shelf life.  
Users must not dispose of containers at their discretion since containers must be disposed of by their owner in accordance with relevant laws and regulations.

#### 14. Transport Information

UN Number : 1265  
 UN : Class 3 (Flammable liquid) Grade I  
 Classification  
 Material name : PENTANES, liquid  
 Container grade : —  
 ICAO/IATA : Class 3; Grade I  
 Marine pollutant : Hazardous liquid substance (Class Y)  
 Precautions : Transport this reference material carefully while keeping it away from direct sunlight and fire and preventing accidental release due to falling, being knocked over, etc.

#### 15. Regulatory Information

- ◇ Fire Service Act
  - Dangerous substance Class 4; Flammable liquid; Special flammables; Non water-soluble liquid (50 L)
- ◇ Industrial Safety and Health Law
  - Enforcement Order Appendix 1; Dangerous substance (Flammable material)
  - Article 57-1 of the Law (Article 18 of the Order); Dangerous substance and hazardous substance whose name must be indicated (Cabinet Order 543)
  - Article 57-2 of the Law (Article 18-2 of the Order); Dangerous substance and hazardous substance whose name must be notified (Cabinet Order 543)
- ◇ Act for the Prevention of Marine Pollution and Maritime Disasters
  - Enforcement Order Appendix 1; Hazardous liquid substance (Class Y)
- ◇ Civil Aeronautics Act
  - Enforcement Regulation Article 194; Dangerous Material Announcement Appendix; Class 1 Flammable liquids
- ◇ Ship Safety Law
  - Dangerous Material Rule Article 3; Dangerous Material Announcement Appendix; Class 1 Flammable liquids
- ◇ Act on Port Regulations
  - Enforcement Regulation Article 12; Dangerous Material Announcement; Flammable liquids
- ◎ **This SDS is originally prepared for the use of the material in Japan, thus the stated laws and regulations are stipulated and carried out in Japan. The use of the material in other countries should be referred to and by application of the relevant laws and regulations of the country in which the material will be used.**

#### 16. Other Information

##### Others

The information in this document is not intended to be exhaustive and is based on currently available information and data. The measures given in this document are applicable only to normal handling conditions. When handling this reference material under special conditions etc., it is recommended to



take safety measures appropriate to each specific application and context of use. This document is intended to provide information and not intended to guarantee anything in handling this reference material.

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