

# Safety Data Sheet



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

Supplier : National Institute of Advanced Industrial Science and Technology (AIST)  
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Prepared on : April 30, 2013  
 Revised on : March 31, 2017  
 ID Number : 4221001

Identity of Substance/Mixture : Certified reference material NMIJ CRM 4221-a  
 Dibutyl Sulfide (High purity dibutyl sulfide for sulfur in fuel oil)  
 Recommended Use of the Chemical and Restriction on Use : Intended used of this CRM is the calibration of instruments, validation of analytical techniques and instruments during analysis of sulfur in fuel samples.  
 Do not use this reference material for other purposes than testing/research.

## 2. Hazards Identification

GHS Classification: Flammable liquid : Hazard Category 4  
 Skin corrosion/irritation : Hazard Category 2  
 Serious Eye Damage/ Eye Irritation : Hazard Category 2A

GHS Label Element:



Signal Word: Warning  
 Hazards Statement: Flammable liquid  
 Skin irritancy  
 Serious eye irritation

Precautionary Statement: [Precaution]  
 Do not handle until all safety precautions have been read and understood.  
 Keep away from ignition sources such as open flames, heat sources and hot surfaces.  
 Use protective gloves, protective glasses protective mask, protective clothing and face mask.

Use only outdoors or in a well-ventilated area.  
Handle this CRM in closed equipment or use local ventilation.  
Strict ban on fire.

Wash hands thoroughly after handling.

Avoid release to the environment.

[First-aid Action]

In the case of fire: Use an appropriate extinguishing media for extinction.

If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If on skin (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with running water/shower and soap.

If exposed or concerned: Get medical advice/attention.

[Storage]

Store in a cool and well-ventilated place.

[Disposal]

Dispose of this reference material in accordance with applicable legislation and local government ordinance.

The other hazards than the above do not result in classification or are not classifiable.

### 3. Composition/Information on Ingredients

Substance or Mixture	:	Single substance
Chemical Identity	:	Dibutyl Sulfide
Synonym	:	Sulfide di-n-butyl
Content	:	99.9 % or above
Chemical Formula	:	$(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{S}$
Molecular Weight	:	146.29
Reference Number in Gazetted List in Japan	in	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (2)-474 Industrial Safety and Health Act : Published
CAS Number	:	544-40-1
Hazardous Ingredient	:	-

### 4. First-aid Measures

If inhaled	:	Remove victim to fresh air and keep at rest in a position comfortable for breathing.
If on skin	:	Remove/Take off contaminated clothing, etc. Rinse thoroughly with clean water and soap. Wash polluted clothing, if reuse them.
If in eyes	:	Rinse cautiously with clean water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

- If Ingested : Rinse mouth thoroughly with water. Drink a lot of water then it induces vomiting. Immediately call a physician.
- Expected Acute and Delayed Symptom : -
- Most Critical : -
- Characteristic and Symptom
- Protection of First-Aid Responder : Use personal protective equipment.

## 5. Fire-fighting Measures

- Extinguishing Media : Powder, foam, carbon dioxide, dry sand, water spray (rod-like water injection prohibited).
- Fire-Specific Hazards : In case of fire, may emit irritating or toxic fume (or gas).
- Specific Fire-Fighting Method : Eliminate ignition sources at the origin of a fire and put out fire by using extinguishing media. Remove movable containers promptly to a safe place. In the case of immovable containers, cool their surroundings with sprayed water.
- Protection of Fire-Fighters : Carry out fire-fighting from the windward in order to avoid breathing hazardous gas. Use personal protective equipment such as fireproof clothing, heat-resistant clothing, protective clothing, compressed air open-circuit self-contained breathing apparatus, compressed oxygen closed-circuit self-contained breathing apparatus, rubber gloves and rubber boots.

## 6. Accidental Release Measures

- Personal Precaution/ Equipment and Emergency Procedures : Remove ignition source in the vicinity immediately. Prepare fire-fighting equipment for the possibility of fires. 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. This reference material features strong offensive odor. Take appropriate actions, therefore, including communication of spillage to local residents, etc.
- Recovery and Neutralization : Collect spillage in containers which can be tightly closed by getting it adsorbed to dry sand, earth, sawdust, wiping cloth, etc. Treat the remains with appropriate amount of sodium hypochlorite solution, and then rinse them away with plenty of water.

Prevention of Secondary Disaster : Remove ignition source in the vicinity immediately. Prepare fire-fighting equipment for the possibility of fires. Use only non-sparking safe tools.

## 7. Handling and Storage Precautions

### Handling

Engineering Precautions : Strict ban on fire.  
 Keep away from hot surfaces and sparks. Do not allow contact with strong oxidizer.  
 When vapor or mist is generated, seal the source, and provide local exhaust ventilation or central ventilation.

Precautions for Safe Handling : Avoid rough handling such as turning over, dropping, giving a shock to or dragging containers.  
 Prevent spill, overflow and scattering, and avoid vapor generation.  
 Keep container tightly closed after using this reference material.  
 Wash hands, face etc. thoroughly and gargle after handling this reference material.  
 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.  
 Use appropriate personal protective equipment to avoid inhalation and contact with eyes, skin and clothing.  
 Use local ventilation system in indoor handling areas.

### Storage

Appropriate Storage Conditions : Protect from direct sunlight. Store in tightly-closed container in a cool and well-ventilated place. Store away from strong oxidizer and ignition source.  
 Store in a clean and light-shielded place at temperatures of 5 °C to - 35 °C.

Engineering Controls : Store in tightly-closed container in a well-ventilated place.  
 Strict ban on fire.

Incompatible materials : Store away from strong oxidizer and ignition source.

Safe Container Packaging Material : Glass

## 8. Exposure Controls/Personal Protection

### Threshold Limit Value

Not specified

### Permissible Concentration

- ACGIH TLV-TWA : Not specified
- Value recommended by : Not specified

Japan Society for Occupational Health	
• OSHA PEL TWA	: Not specified
Engineering Controls	
Ventilation/Exhaust	: Keep container tightly closed and use local ventilation system when vapor, fume or mist is generated.
Storage Precautions	: Use explosion-proof equipment. Take precautionary measures against static discharge.
Personal Protective Equipment (PPE)	
Respiratory System	: Protective gas mask for organic vapors, Self-contained compressed air breathing apparatus.
Hands	: Impervious protective gloves
Eyes	: Eye protector with side plates (or Goggle type)
Skin and Body	: Protective clothing (long-sleeved work clothes), protection boots,

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## 9. Physical and Chemical Properties

• Appearance, etc.	: Liquid
• Color	: Colorless
• Odor	: Strong offensive odor characteristic to sulfur-containing substances
• pH	: No data
• Melting point	: -76 °C
• Boiling point	: About 188 °C
• Flashing point	: 62 °C
• Explosive range	: No data
• Vapor pressure	: No data
• Relative vapor density(Air=1)	: 5.08
• Specific gravity or bulk specific gravity	: 0.837 - 0.843 g/ml (20 °C)
• Solubility	: Soluble in water. Miscible with many organic solvents such as alcohol and ether.
• <i>n</i> -Octanol/water partition coefficient (Log Po/w)	: No data
• Auto-ignition temperature	: No data
• Upper/lower flammability	: 0.837 - 0.843 g/ml (20 °C)

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## 10. Stability and Reactivity

- ◇Chemical Stability
  - Stable under recommended storage conditions
- ◇Reactivity
  - If in contact with strong oxidizer, may ignite.
- ◇Conditions to Avoid

- Sunlight, Heat, open flame, high temperature material, spark, static electrical charge, and other fire sources.

◇ Incompatible materials

- Keep away from strong oxidizer and ignition source.

◇ Hazardous Decomposition Products

- Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>)

### 11. Toxicological Information

Acute Toxicity	Oral Rat	LD50: 2220 mg/kg (RTECS)
	Skin Rabbit	LD50: >5 gm/kg (RTECS)
Skin Corrosion/ Irritation	Skin irritation Rabbit	500 mg/24H Medium (RTECS)
Serious eye damage/ irritation	Eye	No data
Germ Cell Mutagenicity		No data
Carcinogenicity		No data

### 12. Ecological Information

Ecotoxicity

- No data

Degradability, bioaccumulation properties

- No data

Bioaccumulative Potential

- No data

Mobility in soil

- No data

### 13. Disposal Considerations

Residual Waste	:	Incineration method Incinerate this reference material together with combustible oil solution in an incinerator equipped with scrubber. Dispose in accordance with applicable legislation (Waste Disposal and Public Cleaning Act) and local government codes. When the above-mentioned treatments are not possible, entrust disposal of residual waste to a professional waste disposal company licensed by prefectural governor.
Contaminated Container and Package	:	Dispose of containers after thoroughly removing their contents.

### 14. Transport Information

UN Number	:	Not specified
UN	:	Not specified

Classification

Shipping Name : —

Packing Group : —

Marine : Not specified

Pollutant

Precautions : Transport this reference material carefully while keeping it away from direct sunlight and fire and preventing accidental release due to falling, overturning, etc.

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## 15. Regulatory Information

◇ Fire Service Act

- Hazardous Materials 4 Class 2 petroleum (insoluble in water) Danger Rating 3

◇ Industrial Safety and Health Act

- Dangerous goods/Flammable materials (Enforcement Order Appendix 1-4)
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## 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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