



SAFETY DATA SHEET
DIMETHYL DISULFIDE (DMDS)

1. PRODUCT AND COMPANY IDENTIFICATION

Company

Bayou Gas Odorants
300 Williams Lake Road
Pineville, Louisiana 71360

Customer Service Telephone Number: (318) 767-0820
(Monday through Friday, 8:00AM to 5:00PM CST)

Emergency Information

Transportation: CHEMTREC: (800) 424-9300
(24 hrs., 7 days a week)
Medical: Rocky Mountain Poison Center: (866) 767-5089
(24 hrs., 7 days a week)

Product Information

Product name: DIMETHYL DISULFIDE (DMDS)
Synonyms: DMDS
Molecular formula: C₂H₆S₂
Chemical family: Alkyl sulfide
Molecular weight: 94.2 g/mol
Product use: Synthesis intermediate., Do NOT use this SDS for Pesticide/Agricultural Applications.

2. HAZARDS IDENTIFICATION

Emergency Overview

Color: yellow
Physical state: liquid
Odor: pungent

***Classification of the substance or mixture:**

Flammable liquid., Category 2, H225
Oral: Acute toxicity, Category 4, H302
Inhalation: Acute toxicity, Category 3, H331
Eye irritation, Category 2B, H320
Skin sensitisation, Sub-category 1B, H317
Specific target organ toxicity - single exposure, Category 3, H335
Acute aquatic toxicity, Category 1, H400
Chronic aquatic toxicity, Category 1, H410

*For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms:



Signal word:

Danger

Hazard statements:

- H225 : Highly flammable liquid and vapour.
- H302 : Harmful if swallowed.
- H317 : May cause an allergic skin reaction.
- H320 : Causes eye irritation.
- H331 : Toxic if inhaled.
- H335 : May cause respiratory irritation.
- H410 : Very toxic to aquatic life with long lasting effects.

Supplemental Hazard Statements:

Objectionable odor may cause nausea, headache or dizziness.

Precautionary statements:

Prevention:

P210 : Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 : Keep container tightly closed.
P240 : Ground/bond container and receiving equipment.
P241 : Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 : Use only non-sparking tools.
P243 : Take precautionary measures against static discharge.
P261 : Avoid breathing gas/mist/vapours/spray.
P264 : Wash skin thoroughly after handling.
P270 : Do not eat, drink or smoke when using this product.
P271 : Use only outdoors or in a well-ventilated area.
P272 : Contaminated work clothing should not be allowed out of the workplace.
P273 : Avoid release to the environment.
P280 : Wear protective gloves/ eye protection/ face protection.

Response:

P301 + P312 : IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P303 + P361 + P353 : IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P311 : Call a POISON CENTER /doctor.
P330 : Rinse mouth.
P333 + P313 : If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 : If eye irritation persists: Get medical advice/ attention.
P363 : Wash contaminated clothing before reuse.
P370 + P378 : In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P391 : Collect spillage.

Storage:

P403 + P233 : Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 : Store in a well-ventilated place. Keep cool.
P405 : Store locked up.

Disposal:

P501 : Dispose of contents/ container to an approved waste disposal plant.

Supplemental information:

Potential Health Effects:

Objectionable odor may cause nausea, headache or dizziness.
Prolonged or repeated skin contact may cause: dermatitis, redness, rash, skin irritation, scabs, (severity of effects depends on extent of exposure).

3. COMPOSITION/INFORMATION ON INGREDIENTS



SAFETY DATA SHEET
DIMETHYL DISULFIDE (DMDS)

Chemical Name	CAS-No.	Wt/Wt	GHS Classification**
Disulfide, dimethyl	624-92-0	> 99 %	H225, H302, H331, H320, H317, H335, H400, H410

**For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1. Description of necessary first-aid measures:

Inhalation:

If inhaled, remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Call a Poison Control Center.

Skin:

In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eyes:

Immediately flush eye(s) with plenty of water. Get medical attention.

Ingestion:

If swallowed, DO NOT induce vomiting unless directed to do so by medical personnel. Get medical attention. Never give anything by mouth to an unconscious person. Rinse mouth.

4.2. Most important symptoms/effects, acute and delayed:

For most important symptoms and effects (acute and delayed), see Section 2 (Hazard Statements and Supplemental Information) and Section 11 (Toxicology Information) of this SDS.

4.3. Indication of immediate medical attention and special treatment needed, if necessary:

Unless otherwise noted in Notes to Physician, no specific treatment noted; treat symptomatically.

5. FIREFIGHTING MEASURES

Extinguishing media (suitable):

Water spray, Carbon dioxide (CO₂), Foam, Dry chemical

Extinguishing media (unsuitable):

Water may be ineffective., Do not use a solid water stream as it may scatter and spread fire.

Protective equipment:

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear



SAFETY DATA SHEET
DIMETHYL DISULFIDE (DMDS)

(full Bunker Gear) and self-contained breathing apparatus (pressure demand / NIOSH approved or equivalent).

Further firefighting advice:

Cool closed containers exposed to fire with water spray.
Closed containers of this material may explode when subjected to heat from surrounding fire.
After a fire, wait until the material has cooled to room temperature before initiating clean-up activities.
Do not allow run-off from fire fighting to enter drains or water courses.
Fire fighting equipment should be thoroughly decontaminated after use.

Fire and explosion hazards:

When burned, the following hazardous products of combustion can occur:

Carbon oxides
sulfur oxides
hydrogen sulfide
Methylmercaptan
Hazardous organic compounds
Dimethylsulphide

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, Emergency procedures, Methods and materials for containment/clean-up:

Prevent further leakage or spillage if you can do so without risk. Evacuate area of all unnecessary personnel. Ventilate the area. Eliminate all ignition sources. Avoid generation of vapors. Contain and collect spillage with non-combustible absorbent material such as sodium bicarbonate, sodium carbonate, calcium carbonate, clean sand or non-acidic clay and then wet down (dampen) the mixture with water. Sweep or scoop up using non-sparking tools and place into suitable properly labeled containers for prompt disposal. The sweepings should be wetted down further with water. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

Protective equipment:

Appropriate personal protective equipment is set forth in Section 8.

7. HANDLING AND STORAGE

Handling

General information on handling:

Do not taste or swallow.
Avoid breathing vapor or mist.
Avoid contact with skin, eyes and clothing.
Keep away from heat, sparks and flames.
No smoking.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Check that all equipment is properly grounded and installed to satisfy electrical classification requirements.
Container hazardous when empty.
Follow label warnings even after container is emptied.
Emptied container retains vapor and product residue.
RESIDUAL VAPORS MAY EXPLODE ON IGNITION.
DO NOT CUT, DRILL, GRIND, OR WELD ON OR NEAR THIS CONTAINER.
Improper disposal or reuse of this container may be dangerous and/or illegal.

Storage

General information on storage conditions:

Keep in a dry, cool place. Keep away from direct sunlight. Keep container closed when not in use. Store in closed containers, in a secure area to prevent container damage and subsequent spillage. Store in well ventilated area away from heat and sources of ignition such as flame, sparks and static electricity. Ensure that all storage and handling equipment is properly grounded and installed to satisfy electrical classification requirements. Static electricity may accumulate when transferring material. All metal and groundable storage containers, including but not limited to drums, cylinders, Returnable Intermodal Bulk Containers (RIBCs) and Class C Flexible Intermodal Bulk Containers (FIBCs) must be bonded and grounded during filling and emptying operations. Observe all federal, state and local regulations and National Fire Protection Association (NFPA) Codes which pertain to the specific local conditions of storage and use, including OSHA 29 CFR 1910.106 and NFPA 30, 70, 77, and 497.

Storage incompatibility – General:

Store separate from: Strong oxidizing agents

Alkali metals

Acids (concentrated solutions)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Guidelines:

Disulfide, dimethyl (624-92-0)

US. ACGIH Threshold Limit Values

Skin designation

Remarks:

Time weighted average

Can be absorbed through the skin.

0.5 ppm



SAFETY DATA SHEET

DIMETHYL DISULFIDE (DMDS)

Only those components with exposure limits are printed in this section. Limits with skin contact designation above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required. Limits with a sensitizer designation above mean that exposure to this material may cause allergic reactions.

Engineering controls:

Investigate engineering techniques to reduce exposures below airborne exposure limits or to otherwise reduce exposures. Provide ventilation if necessary to minimize exposures or to control exposure levels to below airborne exposure limits (if applicable see above). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems.

Respiratory protection:

Avoid breathing vapor or mist. Where airborne exposure is likely or airborne exposure limits are exceeded (if applicable, see above), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical goggles. Consult respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where there may be a potential for significant exposure or where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Skin protection:

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Wear chemical goggles, a face shield, and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse immediately if skin is contaminated. Remove contaminated clothing immediately and wash before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

Eye protection:

Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment immediately available.

General safety and hygiene measures:

The personal protective equipment (PPE) recommendations above are for use of dimethyl disulfide (DMDS) as an Industrial Chemical.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	yellow
Physical state:	liquid
Odor:	pungent
Odor threshold:	8 - 10 ppb
Flash point	61 °F (16 °C) (Tag closed cup)
Auto-ignition temperature:	572 °F (300 °C)

Lower flammable limit (LFL):	1.1 %(V)
Upper flammable limit (UFL):	16 %(V)
pH:	No data available
Density:	1,062 kg/m ³ (68 °F (20 °C))
Specific Gravity (Relative density):	1.063 (68 °F (20 °C))Water=1 (liquid)
Vapor pressure:	21 mmHg (68 °F (20 °C))
Relative vapor density:	3.25
Vapor density:	not determined
Boiling point/boiling range:	225 - 230 °F (107 - 110 °C)
Melting point/range:	Not applicable
Freezing point:	-120.5 °F (-84.7 °C)
Evaporation rate:	No data available
Solubility in water:	68 °F (20 °C) insoluble
Viscosity, dynamic:	0.62 mPa.s 68 °F (20 °C)
% Volatiles:	100 %
Molecular weight:	94.2 g/mol
Oil/water partition coefficient:	No data available
Thermal decomposition	734 °F (390 °C)
Flammability:	See GHS Classification in Section 2

10. STABILITY AND REACTIVITY

Stability:

The product is stable under normal handling and storage conditions.

Hazardous reactions:

None known.

Materials to avoid:

Alkali metals
Acids

Strong oxidizing agents

Conditions / hazards to avoid:

To avoid thermal decomposition, do not overheat. Contact with combustible materials may enhance the risk of fire. Alkali, acids, solid bleach (strong oxidizer) may cause violent reaction and fire.

Hazardous decomposition products:

Thermal decomposition giving flammable and toxic products

hydrogen sulfide

Methylmercaptan

Dimethylsulphide

Carbon oxides

sulfur oxides

Hazardous organic compounds

11. TOXICOLOGICAL INFORMATION

Data for DIMETHYL DISULFIDE (DMDS)

Acute toxicity

Oral:

Harmful if swallowed. (Rat) LD50 > 300 - < 500 mg/kg.

Dermal:

Practically nontoxic. (Rabbit) LD0 > 5,000 mg/kg.

Inhalation:

Toxic if inhaled. (Rat) 4 h LC50 = 5.05 mg/l 1310 ppm. (vapor)

Signs/effects reported after acute exposure (Rat) 6 h EC = 0.07 mg/l 19 ppm. signs: Degeneration of nasal epithelium

(Rat) 24 h NOAEL = 0.05 mg/l 12 ppm.

Specific target organ toxicity - single exposure:

May cause respiratory irritation.

Skin Irritation:

Causes mild skin irritation. (Rabbit) Irritation Index: 2.0 - 3.0 / 8.0. (4 h)

Eye Irritation:

Causes eye irritation. (Rabbit) Irritation Index: 7 - 20/110.

Skin Sensitization:

May cause allergic skin reaction. LLNA: Local Lymph Node Assay. (Mouse) Skin allergy was observed. (Weak response)

Not a sensitizer. Buehler Test. (Guinea pig) No skin allergy was observed

Repeated dose toxicity

Repeated dermal administration to rabbit / affected organ(s): skin, central nervous system / signs: severe irritation, lethargy / Local irritation (applied undiluted, occluded exposure)

Inhalation administration to rat / affected organ(s): upper respiratory tract / signs: Atrophy of nasal epithelium

Genotoxicity

Assessment in Vitro:

No genetic changes were observed in laboratory tests using: bacteria, animal cells, human cells

Assessment in Vivo:

No genetic changes were observed in laboratory tests using: rats

Developmental toxicity

Exposure during pregnancy. Inhalation (rat and rabbit) / No birth defects were observed. (delays in development, at doses that produce effects in mothers)

Reproductive effects

Two generation reproduction study. Inhalation (rat) / No toxicity to reproduction

12. ECOLOGICAL INFORMATION

Chemical Fate and Pathway

Data on this material and/or a similar material are summarized below.

Data for DIMETHYL DISULFIDE (DMDS)

Biodegradation:

Not readily biodegradable. (28 d) biodegradation < 10 %

Bioaccumulation:

Slight potential to bioaccumulate.

Octanol Water Partition Coefficient:

log Pow = 1.77 - 1.91 (measured)

Photodegradation:

(is rapidly degraded in air by OH radicals.)

Ecotoxicology

Data on this material and/or a similar material are summarized below.

Data for DIMETHYL DISULFIDE (DMDS)

Aquatic toxicity data:

Toxic. Danio rerio (zebra fish) 96 h LC50 = 5 mg/l

Very toxic. Oncorhynchus mykiss (rainbow trout) 96 h LC50 = 0.97 mg/l

Toxic. Cyprinodon variegatus (sheepshead minnow) 96 h LC50 = 5.6 mg/l

Aquatic invertebrates:

Toxic. Daphnia (water flea) 48 h EC50 = 1.8 mg/l

Toxic. Mysid shrimp 96 h LC50 = 5 mg/l

Algae:

Toxic. Skeletonema costatum 96 h ErC50 = 3.9 mg/l

Toxic. Anabaena flos-aquae (cyanobacterium) 96 h ErC50 = 6.7 mg/l

Harmful. Pseudokirchneriella subcapitata 72 h ErC50 = 35 mg/l

Chronic toxicity to fish:

Early-life Stage / Cyprinodon variegatus (sheepshead minnow) 28 d NOEC = 0.473 mg/l

Early-life Stage / Pimephales promelas (fathead minnow) 28 d NOEC = 0.936 mg/l

Chronic toxicity to aquatic invertebrates:

Reproduction & survival test. / Daphnia magna (Water flea) 21 d NOEC (Reproduction inhibition) = 0.0025 mg/l

Reproduction & survival test. / Mysid shrimp 28 d NOEC (Reproduction inhibition) = 0.464 mg/l

13. DISPOSAL CONSIDERATIONS

Waste disposal:

Disposal via incineration is recommended. Dispose of in accordance with federal, state and local regulations. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

Take appropriate measures to prevent release to the environment.

14. TRANSPORT INFORMATION

US Department of Transportation (DOT)

UN Number : 2381
Proper shipping name : Dimethyl disulfide
Class : 3
Subsidiary hazard class : (6.1)
Packaging group : II
Marine pollutant : yes

International Maritime Dangerous Goods Code (IMDG)

UN Number : 2381
Proper shipping name : DIMETHYL DISULPHIDE
Class : 3
Subsidiary hazard class : (6.1)
Packaging group : II
Marine pollutant : yes
Flash point : 61 °F (16 °C) Tag closed cup

15. REGULATORY INFORMATION

Chemical Inventory Status

EU. EINECS	EINECS	Conforms to
United States TSCA Inventory	TSCA	The components of this product are all on the TSCA Inventory.
Canadian Domestic Substances List (DSL)	DSL	All components of this product are on the Canadian DSL
China. Inventory of Existing Chemical Substances in China (IECSC)	IECSC (CN)	Conforms to
Japan. ENCS - Existing and New Chemical Substances Inventory	ENCS (JP)	Conforms to
Japan. ISHL - Inventory of Chemical Substances	ISHL (JP)	Conforms to
Korea. Korean Existing Chemicals Inventory (KECI)	KECI (KR)	Conforms to
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	PICCS (PH)	Conforms to
Australia Inventory of Chemical Substances (AICS)	AICS	Conforms to

United States – Federal Regulations

SARA Title III – Section 302 Extremely Hazardous Chemicals:

The components in this product are either not SARA Section 302 regulated or regulated but present in negligible concentrations.

SARA Title III - Section 311/312 Hazard Categories:

Acute Health Hazard, Fire Hazard

SARA Title III – Section 313 Toxic Chemicals:

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - Reportable Quantity (RQ):

The components in this product are either not CERCLA regulated, regulated but present in negligible concentrations, or regulated with no assigned reportable quantity.

United States – State Regulations



SAFETY DATA SHEET
DIMETHYL DISULFIDE (DMDS)

New Jersey Right to Know

<u>Chemical name</u>	<u>CAS-No.</u>
Disulfide, dimethyl	624-92-0

New Jersey Right to Know – Special Health Hazard Substance(s)

<u>Chemical name</u>	<u>CAS-No.</u>
Disulfide, dimethyl	624-92-0

Pennsylvania Right to Know

<u>Chemical name</u>	<u>CAS-No.</u>
Disulfide, dimethyl	624-92-0

Pennsylvania Right to Know – Environmentally Hazardous Substance(s)

<u>Chemical name</u>	<u>CAS-No.</u>
Disulfide, dimethyl	624-92-0

California Prop. 65

This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive defects.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H317	May cause an allergic skin reaction.
H320	Causes eye irritation.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Miscellaneous:

Use restrictions: For Industrial Use Only. Do NOT use this SDS for Pesticide/Agricultural Applications.

Other information: Refer to National Fire Protection Association (NFPA) Codes 30, 70, 77, and 497 and OSHA 29 CFR 1910.106, for safe handling.

Latest Revision(s):

Revised Section(s):	Wave 2 Chapter 4 update
Reference number:	000000031904
Date of Revision:	07/19/2016
Date Printed:	07/19/2016



SAFETY DATA SHEET
DIMETHYL DISULFIDE (DMDS)

The statements, technical information and recommendations contained herein are believed to be accurate as of the date hereof. Since the conditions and methods of use of the product and of the information referred to herein are beyond our control, BGO expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information; **NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE GOODS DESCRIBED OR THE INFORMATION PROVIDED HEREIN.** The information provided herein relates only to the specific product designated and may not be applicable when such product is used in combination with other materials or in any process. The user should thoroughly test any application before commercialization. Nothing contained herein constitutes a license to practice under any patent and it should not be construed as an inducement to infringe any patent and the user is advised to take appropriate steps to be sure that any proposed use of the product will not result in patent infringement. See SDS for Health & Safety Considerations.