Sulfolene

Version 4.0 Revision Date 2016-07-06

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information

Product Name	:	Sulfolene
Material	:	1094561, 1024666, 1024665, 1024664, 1024663, 1024662, 1024667
Use	:	Chemical intermediate
Company	:	Chevron Phillips Chemical Company LP Specialty Chemicals 10001 Six Pines Drive The Woodlands, TX 77380

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: +800 CHEMCALL (+800 2436 2255) China:+86-21-22157316
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Responsible Department	:	Product Safety and Toxicology Group
E-mail address	:	SDS@CPChem.com
Website	:	www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture

This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Emergency Overview

Warning

Form: Crystalline solid **Physical state**: Solid **Color**: White to off-white **Odor**: pungent

OSHA Hazards : Combustible dust, Moderate eye irritant

Classification

: Combustible dust

Eye irritation, Category 2A

Labeling

Symbol(s) :

Signal Word : Warning

Hazard Statements : May form combustible dust concentrations in air.
H319: Causes serious eye irritation.

Precautionary Statements : **Prevention:**
P264 Wash skin thoroughly after handling.
P280 Wear eye protection/ face protection.
Response:
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ attention.

Carcinogenicity:

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

ACGIH No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

SECTION 3: Composition/information on ingredients

Synonyms : 3-Sulfolene
2,5-Dihydrothiophene-1,1-dioxide

Molecular formula : C4H6SO2

Component	CAS-No.	Weight %
Sulfolene	77-79-2	90 - 100

SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance.

If inhaled : If unconscious place in recovery position and seek medical

advice. If symptoms persist, call a physician.

In case of skin contact	:	Wash off with warm water and soap.
In case of eye contact	:	Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

SECTION 5: Firefighting measures

Flash point	:	113 °C (235 °F) estimated
Autoignition temperature	:	No data available
Unsuitable extinguishing media	:	High volume water jet.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Standard procedure for chemical fires. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Fire and explosion protection	:	Avoid dust formation. Provide appropriate exhaust ventilation at places where dust is formed.
Hazardous decomposition products	:	Butadiene. Sulfur oxides.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Avoid dust formation. Avoid breathing dust.
Environmental precautions	:	Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up	:	Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Handling

Advice on safe handling	:	Avoid formation of respirable particles. Do not breathe vapors/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Avoid dust formation. Provide appropriate exhaust ventilation at places where dust is formed.

Storage

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

US

Ingredients	Basis	Value	Control parameters	Note
Sulfur dioxide	ACGIH	STEL	0.25 ppm,	pulm func, LRT irr, A4,
	OSHA Z-1	TWA	5 ppm, 13 mg/m3	(b),
	OSHA Z-1-A	TWA	2 ppm, 5 mg/m3	
	OSHA Z-1-A	STEL	5 ppm, 13 mg/m3	

(b) The value in mg/m3 is approximate.
A4 Not classifiable as a human carcinogen
LRT irr Lower Respiratory Tract irritation
pulm func Pulmonary function

Contains no substances with occupational exposure limit values.

Engineering measures

Adequate ventilation to control airborned concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Air-Purifying Respirator for Dusts and Mists / P100. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Eye wash bottle with pure water. Safety glasses.

Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Protective suit. Safety shoes.
Hygiene measures	:	When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

Form	:	Crystalline solid
Physical state	:	Solid
Color	:	White to off-white
Odor	:	pungent

Safety data

Flash point	:	113 °C (235 °F) estimated
Lower explosion limit	:	No data available
Upper explosion limit	:	No data available
Oxidizing properties	:	no
Autoignition temperature	:	No data available
Molecular formula	:	C4H6SO2
Molecular weight	:	118.16 g/mol
pH	:	Not applicable
Freezing point	:	No data available
Pour point		No data available
Boiling point/boiling range	:	Not applicable
Vapor pressure	:	Not applicable
Relative density	:	1.31 at 15.6 °C (60.1 °F), estimated
Water solubility	:	13% at 20C (68F)
Partition coefficient: n-octanol/water	:	No data available
Viscosity, kinematic	:	Not applicable
Relative vapor density	:	Not applicable

Evaporation rate	:	Not applicable

SECTION 10: Stability and reactivity

Chemical stability	:	This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Conditions to avoid	:	No data available.
Hazardous decomposition products	:	Butadiene Sulfur oxides
Other data	:	No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Acute oral toxicity

Sulfolene	:	LD50: 2,876 mg/kg Species: Rat Sex: male and female Method: OECD Test Guideline 401

Acute inhalation toxicity

Sulfolene	:	Exposure time: 4 h Species: Rat Sex: male and female Test atmosphere: vapor Method: OECD Test Guideline 403 An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.

Skin irritation

Sulfolene	:	No skin irritation

Eye irritation

Sulfolene	:	Eye irritation

Sensitization

Sulfolene	:	Did not cause sensitization on laboratory animals.

Repeated dose toxicity

Sulfolene : Species: rat (male)
Application Route: oral gavage
Dose: 0, 25, 75, 150 mg/kg/d
Exposure time: 28 d
Number of exposures: daily
NOEL: 25 mg/kg
Lowest observable effect level: 75 mg/kg
Method: OECD Guideline 422
Target Organs: Kidney, Liver

Species: rat (female)
Application Route: oral gavage
Dose: 0, 10, 25, 75mg/kg/d
Exposure time: 40 - 52 d
Number of exposures: daily
NOEL: 25 mg/kg
Lowest observable effect level: 75 mg/kg
Method: OECD Guideline 422

Species: Mouse, male
Sex: male
Application Route: oral gavage
Dose: 316,562,1000,1780,3160 mg/kg/d
Exposure time: 6 wk
Number of exposures: 5 d/wk
NOEL: 3,160 mg/kg
Lowest observable effect level: 316 - 3,160 mg/kg

Species: Mouse, female
Sex: female
Application Route: oral gavage
Dose: 316,562,1000,1780,3160 mg/kg/d
Exposure time: 6 wk
Number of exposures: 5 d/wk
NOEL: 178 mg/kg
Lowest observable effect level: 316 - 3,160 mg/kg

Carcinogenicity

Sulfolene : Species: Rat
Sex: female
Dose: 0, 120, 240 mg/kg
Exposure time: 60-78 wks
Number of exposures: 5 d/wk
Remarks: No evidence of carcinogenicity

Species: Rat
Sex: male
Dose: 0,197, 372 mg/kg
Exposure time: 60-78 wks
Number of exposures: 5 d/wk
Remarks: No evidence of carcinogenicity

Species: Mouse
Sex: female
Dose: 0, 384, 768 mg/kg
Exposure time: 60-78 wks
Number of exposures: 5 d/wk
Remarks: No evidence of carcinogenicity

Species: Mouse
Sex: male
Dose: 0, 311, 622 mg/kg
Exposure time: 60-78 wks
Number of exposures: 5 d/wk
Remarks: No evidence of carcinogenicity

Reproductive toxicity

Sulfolene : Species: Rat
Sex: male
Application Route: oral gavage
Dose: 0, 25, 150 mg/kg/d
Exposure time: 28 d
Number of exposures: daily
Method: OECD Guideline 422
NOAEL Parent: 75 mg/kg

Species: Rat
Sex: female
Application Route: oral gavage
Dose: 0. 10, 25, 75 mg/kg/d
Exposure time: 40 - 52 d
Number of exposures: daily
Method: OECD Guideline 422
NOAEL Parent: 75 mg/kg
NOAEL F1: 25 mg/kg

Sulfolene
Aspiration toxicity : No aspiration toxicity classification.

Sulfolene
Further information : No data available.

SECTION 12: Ecological information

Toxicity to fish

Sulfolene : LC50: 940 mg/l
Exposure time: 96 h
Species: Salmo gairdneri (Rainbow trout)
static test Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates

Sulfolene	:	EC50: 800 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) Immobilization Method: OECD Test Guideline 202

Toxicity to algae

Sulfolene	:	EC50: > 1,000 mg/l Exposure time: 4 Days Species: Selenastrum capricornutum (algae) Growth inhibition Method: OECD Test Guideline 201

Biodegradability

Sulfolene	:	aerobic Result: Not readily biodegradable. 2 % Testing period: 28 d Method: OECD Test Guideline 301B

Ecotoxicology Assessment

Additional ecological information	:	This material is not expected to be harmful to aquatic organisms.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product	:	Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN3335, AVIATION REGULATED SOLID, N.O.S., (2,5-DIHYDROTHIOPEHENE-1,1-DIOXIDE), 9

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO – KNOW

SARA 302 Threshold Planning Quantity : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Ingredients : 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.

Clean Air Act

Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

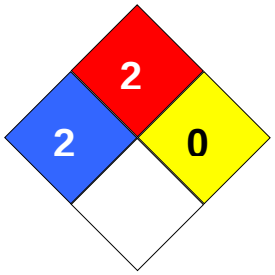
California Prop. 65 Ingredients : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

Europe REACH	:	On the inventory, or in compliance with the inventory
United States of America TSCA	:	On the inventory, or in compliance with the inventory
Canada DSL	:	On the inventory, or in compliance with the inventory
Australia AICS	:	Not in compliance with the inventory
New Zealand NZIoC	:	Not in compliance with the inventory
Japan ENCS	:	On the inventory, or in compliance with the inventory
Korea KECI	:	On the inventory, or in compliance with the inventory
Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	Not in compliance with the inventory

SECTION 16: Other information

NFPA Classification : Health Hazard: 2
Fire Hazard: 2
Reactivity Hazard: 0



Further information

Legacy SDS Number : 25500

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		