

# **Safety Data Sheet**

according to Regulation (EC) No 1907/2006

## Tetrahydrofuran (THF) > 99 % pure stabilized with 2,6-di-tert-butyl-4-methylphenol (BHT)

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

## 1.1. Product identifier

Tetrahydrofuran (THF) > 99 % pure stabilized with 2,6-di-tert-butyl-4-methylphenol (BHT)

REACH Registration Number: 01-2119444314-46-XXXX

CAS No: 109-99-9
Index No: 603-025-00-0
EC No: 203-726-8

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

#### Use of the substance/mixture

Laboratory chemicals

Industrial uses: Uses of substances as such or in preparations at industrial sites

Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

#### Uses advised against

Do not use for private purposes (household).

### 1.3. Details of the supplier of the safety data sheet

Company name: AnalytiChem GmbH Street: Stempelstraße 6 Place: D-47167 Duisburg

Telephone: 0203/5194-0 Telefax: 0203/5194-290

e-mail: info@analytichem.de

Contact person: Abteilung Produktsicherheit Telephone: 0203/5194-107/117

e-mail: produktsicherheit@analytichem.de

Internet: www.analytichem.de

Responsible Department: Abteilung Produktsicherheit

1.4. Emergency telephoneFor Hazardous Materials [or Dangerous Goods] Incidents Spill, Leak, Fire,number:Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada:

1-800-424-9300 Outside USA and Canada: +1 703-741-5970 (collect calls

accepted)

## **Further Information**

No data available

## **SECTION 2: Hazards identification**

# 2.1. Classification of the substance or mixture

## Regulation (EC) No 1272/2008

Flam. Liq. 2; H225 Carc. 2; H351 Acute Tox. 4; H302 Eye Irrit. 2; H319 STOT SE 3; H335 STOT SE 3; H336

Full text of hazard statements: see SECTION 16.

## 2.2. Label elements

# Regulation (EC) No 1272/2008

Signal word: Danger



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### Pictograms:







#### **Hazard statements**

H225 Highly flammable liquid and vapour.

H302 Harmful if swallowed.

H319 Causes serious eye irritation.
 H335 May cause respiratory irritation.
 H336 May cause drowsiness or dizziness.
 H351 Suspected of causing cancer.

#### **Precautionary statements**

P201 Obtain special instructions before use.

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No

smoking.

P233 Keep container tightly closed.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P370+P378 In case of fire: Use sand, extinguishing powder or alcohol-resistant foam to extinguish.

### Special labelling of certain mixtures

EUH019 May form explosive peroxides.

### 2.3. Other hazards

No data available

## **SECTION 3: Composition/information on ingredients**

## 3.1. Substances

Sum formula: C4H8O Molecular weight: 72,11 g/mol

## **Hazardous components**

CAS No	Chemical name					
	EC No	Index No REACH No				
	Classification (Regulation (EC) No 1272/2008)					
109-99-9	tetrahydrofuran					
	203-726-8 603-025-00-0 01-2119444314-46-XXXX					
	Flam. Liq. 2, Carc. 2, Acute Tox. 4, Eye Irrit. 2, STOT SE 3, STOT SE 3; H225 H351 H302 H319 H335 H336 EUH019					

Full text of H and EUH statements: see section 16.

## Specific Conc. Limits, M-factors and ATE

CAS No	EC No	Chemical name	Quantity			
	Specific Conc. Limits, M-factors and ATE					
109-99-9	203-726-8	tetrahydrofuran	100 %			
	dermal: LD50 = > 2000 mg/kg; oral: LD50 = 1,65 mg/kg Eye Irrit. 2; H319: >= 25 - 100 STOT SE 3; H335: >= 25 - 100					

### **Further Information**

This product does not contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 57 above the respective regulatory concentration limit of = 0.1 % (w/w).

## **SECTION 4: First aid measures**



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### 4.1. Description of first aid measures

#### General information

No data available

#### After inhalation

Provide fresh air.

Call a physician immediately.

#### After contact with skin

Wash immediately with: Water

Take off immediately all contaminated clothing and wash it before reuse.

### After contact with eyes

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

Remove contact lenses, if present and easy to do. Continue rinsing.

#### After ingestion

Rinse mouth immediately and drink plenty of water.

Call a physician immediately.

## 4.2. Most important symptoms and effects, both acute and delayed

Irritant

Cough

Dyspnoea

Narcotic effects

## 4.3. Indication of any immediate medical attention and special treatment needed

No data available

### **SECTION 5: Firefighting measures**

# 5.1. Extinguishing media

### Suitable extinguishing media

Co-ordinate fire-fighting measures to the fire surroundings.

### Unsuitable extinguishing media

no restriction

## 5.2. Special hazards arising from the substance or mixture

Combustible liquids

Vapours are heavier than air, spread along floors and form explosive mixtures with air.

Beware of reignition.

Hazardous combustion products

## 5.3. Advice for firefighters

In case of fire: Wear self-contained breathing apparatus.

Avoid contact with skin, eyes and clothes.

### **Additional information**

Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

Move undamaged containers from immediate hazard area if it can be done safely.

Use water spray jet to protect personnel and to cool endangered containers.

## **SECTION 6: Accidental release measures**

### 6.1. Personal precautions, protective equipment and emergency procedures

#### General advice

Keep away from sources of ignition - No smoking.

This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe).



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Take action to prevent static discharges.

#### For non-emergency personnel

Provide adequate ventilation.

Use personal protection equipment.

Avoid contact with skin, eyes and clothes.

Remove persons to safety.

**Emergency procedures** 

Do not breathe dust/fume/gas/mist/vapours/spray.

### For emergency responders

Precautionary statements For emergency responders: Personal protection equipment: see section 8

### 6.2. Environmental precautions

Do not allow to enter into surface water or drains.

The vapour of the product is heavier than air and may accumulate below ground level, in pits, channels and basements in higher concentration.

Danger of explosion

### 6.3. Methods and material for containment and cleaning up

#### For containment

Cover drains.

Prevent spread over a wide area (e.g. by containment or oil barriers).

Collect in closed and suitable containers for disposal.

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

#### For cleaning up

Clean contaminated articles and floor according to the environmental legislation.

## Other information

Provide adequate ventilation.

Do not breathe dust/fume/gas/mist/vapours/spray.

Wear breathing apparatus if exposed to vapours/dusts/aerosols.

#### 6.4. Reference to other sections

Safe handling: see section 7

Personal protection equipment: see section 8

Disposal: see section 13

### **SECTION 7: Handling and storage**

## 7.1. Precautions for safe handling

### Advice on safe handling

Avoid exposure - obtain special instructions before use.

Read label before use. Handle and open container with care.

When using do not eat, drink, smoke, sniff. Keep container tightly closed.

Use personal protection equipment. Use extractor hood (laboratory).

Do not breathe vapour/aerosol. Provide adequate ventilation.

## Advice on protection against fire and explosion

Take action to prevent static discharges.

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

## Advice on general occupational hygiene

Keep away from food, drink and animal feedingstuffs.

Wash hands and face before breaks and after work and take a shower if necessary.

When using do not eat or drink.

Avoid: aerosol or mist formation Do not breathe vapour/aerosol.

### Further information on handling

Take off immediately all contaminated clothing and wash it before reuse.

Draw up and observe skin protection programme. Wash hands and face before breaks and after work and take



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a shower if necessary. If handled uncovered, arrangements with local exhaust ventilation have to be used.

## 7.2. Conditions for safe storage, including any incompatibilities

## Requirements for storage rooms and vessels

Keep container tightly closed in a cool, well-ventilated place.

Store in a cool dry place.

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

## Further information on storage conditions

Protect from sunlight.

Protect against: Light
minimum storage temperature +5°C
maximum storage temperature +30°C

### 7.3. Specific end use(s)

Laboratory chemicals

# **SECTION 8: Exposure controls/personal protection**

## 8.1. Control parameters

## Occupational exposure limits

CAS No	Substance	ppm	mg/m³	fib/cm³	Category	Origin
109-99-9	Tetrahydrofuran	50	150		TWA (8 h)	
		100	300		STEL (15 min)	

### **Biological limit values**

CAS No	Substance	Parameter	Value	Test material	Sampling time
109-99-9	Tetrahydrofuran	THF	2 mg/L	Urine	End of shift

### **DNEL/DMEL values**

CAS No	Substance			
DNEL type		Exposure route	Effect	Value
109-99-9	tetrahydrofuran			
Worker DNEL,	long-term	inhalation	systemic	72,4 mg/m³
Worker DNEL,	acute	inhalation	systemic	96 mg/m³
Worker DNEL,	long-term	inhalation	local	150 mg/m³
Worker DNEL,	Worker DNEL, acute		local	300 mg/m³
Worker DNEL, long-term		dermal	systemic	12,6 mg/kg bw/day
Consumer DNE	EL, long-term	inhalation	systemic	13 mg/m³
Consumer DNE	EL, acute	inhalation	systemic	52 mg/m³
Consumer DNE	EL, long-term	inhalation	local	75 mg/m³
Consumer DNEL, acute		inhalation	local	150 mg/m³
Consumer DNEL, long-term		dermal	systemic	1,5 mg/kg bw/day
Consumer DNE	EL, long-term	oral	systemic	1,5 mg/kg bw/day



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#### **PNEC** values

CAS No	Substance					
Environmenta	Environmental compartment Value					
109-99-9	tetrahydrofuran					
Freshwater		4,32 mg/l				
Freshwater (in	21,6 mg/l					
Marine water		0,432 mg/l				
Freshwater se	23,3 mg/kg					
Marine sedim	2,33 mg/kg					
Secondary po	67 mg/kg					
Micro-organis	4,6 mg/l					
Soil		2,13 mg/kg				

### 8.2. Exposure controls

### Appropriate engineering controls

Technical measures and the application of suitable work processes have priority over personal protection equipment.

If handled uncovered, arrangements with local exhaust ventilation have to be used.

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

### Eye/face protection

goggles

Face protection umbrella

### **Hand protection**

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

Protective gloves are recommended Company KCL GmbH, D-36124 Eichenzell, email: vertrieb@kcl.de With specification (test according to EN374):

By long-term hand contact: No data available

By short-term hand contact

Trade name/designation: KCL 890 Vitoject® Suitable material: FKM (fluoro rubber) 0,7 mm

Wearing time with occasional contact (splashes): > 10 min

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types. This recommendation applies only to the product stated in the safety data sheet<(>,<)> supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

## Skin protection

Wear fire resistant or flame retardant clothing.

Take off immediately all contaminated clothing and wash it before reuse.

Wear suitable protective clothing. Take off immediately all contaminated clothing.

Wash hands and face before breaks and after work and take a shower if necessary.



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### Respiratory protection

Wear breathing apparatus if exposed to vapours/dusts/aerosols. Filtering device with filter or ventilator filtering device of type: A

#### **Environmental exposure controls**

Do not allow to enter into surface water or drains.

Due to danger of explosion, prevent leakage of vapours into cellars, flues and ditches.

Danger of explosion

## **SECTION 9: Physical and chemical properties**

### 9.1. Information on basic physical and chemical properties

Physical state: Liquid
Colour: colourless
Odour: like: Ether

Test method

Melting point/freezing point: -108,5 °C
Boiling point or initial boiling point and 65-66 °C

boiling range:

Flammability: No data available Lower explosion limits: 1.5 vol. % Upper explosion limits: 12.4 vol. % Flash point: -21.5 °C 215 °C Auto-ignition temperature: Decomposition temperature: No data available pH-Value (at 20 °C): 7-8 (200 g/l) Viscosity / kinematic: No data available Water solubility: easily soluble

Solubility in other solvents

No data available

Partition coefficient n-octanol/water: log Pow: 0,45 (25 °C) Vapour pressure: 173 hPa

(at 20 °C)

Density (at 20 °C): 0,89 g/cm³
Bulk density: No data available
Relative vapour density: No data available

### 9.2. Other information

## Information with regard to physical hazard classes

Explosive properties

Vapours are heavier than air, spread along floors and form explosive mixtures with air.

Sustaining combustion: Sustaining combustion

Self-ignition temperature 215°C

Solid: No data available
Gas: No data available

Oxidizing properties

No data available

### Other safety characteristics

Evaporation rate:

Solvent separation test:

No data available
Solvent content:

No data available
Solid content:

No data available
Sublimation point:

No data available
Softening point:

No data available



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Pour point: No data available

No data available

Viscosity / dynamic: 0,48 mPa·s

(at 20 °C)

Flow time: No data available

**Further Information** 

May form explosive peroxides.

## **SECTION 10: Stability and reactivity**

## 10.1. Reactivity

Vapours may form explosive mixtures with air.

Formation of: Peroxides

### 10.2. Chemical stability

Protect against:

Light

Air

### 10.3. Possibility of hazardous reactions

**Bromine** 

Oxidising agent

Oxygen

Acids

Peroxides

alkali hydroxides

hydrides, potassium

thionyl chloride, halides

titanium tetrachloride

### 10.4. Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Light

Air

### 10.5. Incompatible materials

Rubber articles

Plastic articles

tin

## 10.6. Hazardous decomposition products

Peroxides

In case of fire:

**SECTION 5: Firefighting measures** 

## **Further information**

Peroxides

## **SECTION 11: Toxicological information**

## 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

### Toxicocinetics, metabolism and distribution

Avoid exposure - obtain special instructions before use.

## **Acute toxicity**

Harmful if swallowed.



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CAS No	Chemical name								
	Exposure route	Dose		Species	Source	Method			
109-99-9	tetrahydrofuran								
	oral	LD50 mg/kg	1,65	Rat	, , , ,	Conducted according to a published proce			
	dermal	LD50 mg/kg	> 2000	Rat	Study report (2009)	OECD Guideline 402			

### Irritation and corrosivity

Causes serious eye irritation.

Skin corrosion/irritation: Based on available data, the classification criteria are not met.

Prolonged or repeated skin contact may cause removal of natural fat from the skin resulting in dermatitis (skin inflammation).

### Sensitising effects

Based on available data, the classification criteria are not met.

#### Carcinogenic/mutagenic/toxic effects for reproduction

Suspected of causing cancer. (tetrahydrofuran)

Germ cell mutagenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity: Based on available data, the classification criteria are not met.

## STOT-single exposure

May cause respiratory irritation. (tetrahydrofuran)

May cause drowsiness or dizziness. (tetrahydrofuran)

## STOT-repeated exposure

Based on available data, the classification criteria are not met.

#### **Aspiration hazard**

Based on available data, the classification criteria are not met.

#### Specific effects in experiment on an animal

No data available

#### Additional information on tests

No data available

#### **Practical experience**

No data available

## 11.2. Information on other hazards

# Other information

No data available

### **Further information**

Irritant

Cough

Dyspnoea

Narcotic effects

## **SECTION 12: Ecological information**

## 12.1. Toxicity



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CAS No	Chemical name									
	Aquatic toxicity	Dose	Dose		Species	Source	Method			
109-99-9	tetrahydrofuran	tetrahydrofuran								
	Acute fish toxicity	LC50 mg/l	2160	96 h	Pimephales promelas	Center for Lake Superior Environmental S	OECD Guideline 203			
	Fish toxicity	NOEC	216 mg/l	33 d	Pimephales promelas	Environmental toxicology and chemistry 4	Effect on hatching rate, survival and gr			

### 12.2. Persistence and degradability

39 %; 28 d; aerob

OECD-301D

Not readily biodegradable (according to OECD criteria)

### 12.3. Bioaccumulative potential

No indication of bioaccumulation potential.

#### Partition coefficient n-octanol/water

CAS No	Chemical name	Log Pow
109-99-9	tetrahydrofuran	0,45

#### 12.4. Mobility in soil

No data available

## 12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII.

#### 12.6. Endocrine disrupting properties

This substance does not have endocrine disrupting properties with respect to non-target organisms.

#### 12.7. Other adverse effects

Avoid release to the environment.

### **Further information**

Do not allow to enter into surface water or drains.

### **SECTION 13: Disposal considerations**

## 13.1. Waste treatment methods

## **Disposal recommendations**

Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste.

Send to a physico-chemical treatment facility under observation of official regulations.

Do not mix with other wastes.

## Contaminated packaging

Handle contaminated packages in the same way as the substance itself.

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

# **SECTION 14: Transport information**

#### Land transport (ADR/RID)

14.1. UN number or ID number: UN 2056

14.2. UN proper shipping name: TETRAHYDROFURAN

14.3. Transport hazard class(es):
14.4. Packing group:

Hazard label:
3



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Classification code: F1
Limited quantity: 1 L
Excepted quantity: E2
Transport category: 2
Hazard No: 33
Tunnel restriction code: D/E

Inland waterways transport (ADN)

14.1. UN number or ID number: UN 2056

14.2. UN proper shipping name: TETRAHYDROFURAN

14.3. Transport hazard class(es):314.4. Packing group:IIHazard label:3Classification code:F1Limited quantity:1 LExcepted quantity:E2

Marine transport (IMDG)

14.1. UN number or ID number: UN 2056

**14.2. UN proper shipping name:** TETRAHYDROFURAN

14.3. Transport hazard class(es):314.4. Packing group:IIHazard label:3Special Provisions:-Limited quantity:1 LExcepted quantity:E2EmS:F-E, S-D

Air transport (ICAO-TI/IATA-DGR)

14.1. UN number or ID number: UN 2056

14.2. UN proper shipping name: TETRAHYDROFURAN

14.3. Transport hazard class(es):314.4. Packing group:IIHazard label:3Limited quantity Passenger:1 LPassenger LQ:Y341Excepted quantity:E2

IATA-packing instructions - Passenger:353IATA-max. quantity - Passenger:5 LIATA-packing instructions - Cargo:364IATA-max. quantity - Cargo:60 L

14.5. Environmental hazards

ENVIRONMENTALLY HAZARDOUS: No

# **SECTION 15: Regulatory information**

## 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

## **EU** regulatory information

Restrictions on use (REACH, annex XVII):

Entry 3, Entry 40, Entry 75

Information according to 2012/18/EU P5c F

(SEVESO III):

P5c FLAMMABLE LIQUIDS

**National regulatory information** 



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Employment restrictions: Observe restrictions to employment for juveniles according to the 'juvenile

work protection guideline' (94/33/EC). Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or

nursing mothers.

Water hazard class (D): 1 - slightly hazardous to water

### **SECTION 16: Other information**

#### Changes

This data sheet contains changes from the previous version in section(s): 1,2.

### Relevant H and EUH statements (number and full text)

H225 Highly flammable liquid and vapour.

H302 Harmful if swallowed.

H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
H351 Suspected of causing cancer.
EUH019 May form explosive peroxides.

### **Further Information**

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material. The information is based on the present level of our knowledge. It does not, however, give assurance of product properties and establishes no contract legal rights.

The receiver of our product is singularly responsible for adhering to existing laws and regulations.