

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 28.06.2017

Version 21.2

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

### 1.1 Product identifier

Catalogue No. 108327

Product name Toluene for liquid chromatography LiChrosolv®

REACH Registration Number 01-2119471310-51-xxxx

CAS-No. 108-88-3

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

Identified uses Reagent for analysis, Solvent  
For additional information on uses please refer to the Merck Chemicals portal ([www.merckgroup.com](http://www.merckgroup.com)).

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

Company Merck KGaA \* 64271 Darmstadt \* Germany \* Phone:+49 6151 72-0

Responsible Department LS-QHC \* e-mail: [prodsafe@merckgroup.com](mailto:prodsafe@merckgroup.com)

1.4 Emergency telephone number Please contact the regional company representation in your country.

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## SECTION 2. Hazards identification

### 2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

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Flammable liquid, Category 2, H225

Skin irritation, Category 2, H315

Specific target organ toxicity - repeated exposure, Category 2, Central nervous system, H373

Reproductive toxicity, Category 2, H361d

Aspiration hazard, Category 1, H304

Specific target organ toxicity - single exposure, Category 3, Central nervous system, H336

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

## 2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

*Hazard pictograms*



*Signal word*

Danger

*Hazard statements*

H225 Highly flammable liquid and vapour.

H304 May be fatal if swallowed and enters airways.

H315 Causes skin irritation.

H336 May cause drowsiness or dizziness.

H361d Suspected of damaging the unborn child.

H373 May cause damage to organs (Central nervous system) through prolonged or repeated exposure.

*Precautionary statements*

Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P240 Ground/bond container and receiving equipment.

Response

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

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P314 Get medical advice/ attention if you feel unwell.

Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

According to the criteria, the general hazard statement can be replaced by the hazard statement indicating only the property of concern, where either fertility or developmental effects are proven to be not relevant. See Annex VI, 1.2.3, General hazard statement not specifying the route of exposure as the necessary information is not available. See Annex VI, 1.2.2

**Reduced labelling (≤125 ml)**

*Hazard pictograms*



*Signal word*

Danger

*Hazard statements*

H304 May be fatal if swallowed and enters airways.

H361d Suspected of damaging the unborn child.

*Precautionary statements*

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

*Index-No.* 601-021-00-3

## 2.3 Other hazards

None known.

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## SECTION 3. Composition/information on ingredients

### 3.1 Substance

Formula	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	C <sub>7</sub> H <sub>8</sub> (Hill)
Index-No.	601-021-00-3	
EC-No.	203-625-9	

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Molar mass 92,14 g/mol

## Hazardous components (REGULATION (EC) No 1272/2008)

### *Chemical name (Concentration)*

CAS-No.	Registration number	Classification
Toluene ( $\leq 100\%$ )		
108-88-3	01-2119471310-51-xxxx	Flammable liquid, Category 2, H225 Skin irritation, Category 2, H315 Specific target organ toxicity - repeated exposure, Category 2, H373 Reproductive toxicity, Category 2, H361d Aspiration hazard, Category 1, H304 Specific target organ toxicity - single exposure, Category 3, H336

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

## 3.2 Mixture

Not applicable

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## SECTION 4. First aid measures

### 4.1 Description of first aid measures

After inhalation: fresh air. Call in physician.

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Consult a physician.

After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Call a physician immediately. Pulmonary failure possible after aspiration of vomit.

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

irritant effects, Headache, Drowsiness, Dizziness, Nausea, Vomiting, inebriation, Convulsions, somnolence, Circulatory collapse, CNS disorders, respiratory paralysis, respiratory arrest, Unconsciousness, death

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

No information available.

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## SECTION 5. Firefighting measures

### 5.1 Extinguishing media

*Suitable extinguishing media*

Foam, Carbon dioxide (CO<sub>2</sub>), Dry powder

*Unsuitable extinguishing media*

For this substance/mixture no limitations of extinguishing agents are given.

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

Combustible.

Pay attention to flashback.

Vapours are heavier than air and may spread along floors.

Development of hazardous combustion gases or vapours possible in the event of fire.

Forms explosive mixtures with air at ambient temperatures.

### 5.3 Advice for firefighters

*Special protective equipment for firefighters*

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

*Further information*

Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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## SECTION 6. Accidental release measures

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

Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders:

Protective equipment see section 8.

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## 6.2 Environmental precautions

Do not let product enter drains. Risk of explosion.

## 6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

## 6.4 Reference to other sections

Indications about waste treatment see section 13.

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## SECTION 7. Handling and storage

### 7.1 Precautions for safe handling

#### *Advice on safe handling*

Observe label precautions.

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

#### *Advice on protection against fire and explosion*

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

#### *Hygiene measures*

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

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

#### *Storage conditions*

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Recommended storage temperature see product label.

### 7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

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## SECTION 8. Exposure controls/personal protection

### 8.1 Control parameters

#### Derived No Effect Level (DNEL)

Worker DNEL, acute	Systemic effects	inhalation	384 mg/m <sup>3</sup>
Worker DNEL, acute	Local effects	inhalation	343 mg/m <sup>3</sup>
Worker DNEL, longterm	Systemic effects	inhalation	192 mg/m <sup>3</sup>
Worker DNEL, longterm	Local effects	inhalation	192 mg/m <sup>3</sup>
Worker DNEL, longterm	Systemic effects	dermal	384 mg/kg Body weight
Consumer DNEL, acute	Systemic effects	inhalation	226 mg/m <sup>3</sup>
Consumer DNEL, acute	Local effects	inhalation	226 mg/m <sup>3</sup>
Consumer DNEL, longterm	Systemic effects	inhalation	56,5 mg/m <sup>3</sup>
Consumer DNEL, longterm	Systemic effects	oral	8,13 mg/kg Body weight
Consumer DNEL, longterm	Systemic effects	dermal	226 mg/kg Body weight

#### Predicted No Effect Concentration (PNEC)

PNEC Fresh water	0,68 mg/l
PNEC Fresh water sediment	16,39 mg/kg
PNEC Soil	2,89 mg/kg
PNEC Sewage treatment plant	13,61 mg/l

### 8.2 Exposure controls

#### Engineering measures

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Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

## Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

### *Eye/face protection*

Safety glasses

### *Hand protection*

full contact:

Glove material:	Viton (R)
Glove thickness:	0,70 mm
Break through time:	> 480 min

splash contact:

Glove material:	Viton (R)
Glove thickness:	0,70 mm
Break through time:	> 480 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 890 Vitoject® (full contact), KCL 890 Vitoject® (splash contact).

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](http://www.kcl.de)).

### *Other protective equipment*

Flame retardant antistatic protective clothing.



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## *Respiratory protection*

required when vapours/aerosols are generated.

Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

## **Environmental exposure controls**

Do not let product enter drains.

Risk of explosion.

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

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

Form	liquid
Colour	colourless
Odour	characteristic
Odour Threshold	0,2 - 68,6 ppm
pH	Not applicable
Melting point	-95 °C
Boiling point/boiling range	110,6 °C at 1.013 hPa
Flash point	4 °C at 1.013 hPa
	Method: c.c.

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Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1,1 %(V)
Upper explosion limit	7,1 %(V)
Vapour pressure	29 hPa at 20 °C
Relative vapour density	3,18
Density	0,87 g/cm <sup>3</sup> at 20 °C
Relative density	No information available.
Water solubility	0,52 g/l at 20 °C
Partition coefficient: n-octanol/water	log Pow: 2,65 (experimental) (IUCILID) Bioaccumulation is not expected.
Auto-ignition temperature	No information available.
Decomposition temperature	Distillable in an undecomposed state at normal pressure.
Viscosity, dynamic	0,6 mPa.s at 20 °C
Explosive properties	Not classified as explosive.
Oxidizing properties	none

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## 9.2 Other data

Ignition temperature	535 °C Method: DIN 51794
Viscosity, kinematic	0,7 mm <sup>2</sup> /s at 20 °C
Conductivity	< 0,01 µS/cm

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## SECTION 10. Stability and reactivity

### 10.1 Reactivity

Vapours may form explosive mixture with air.

### 10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

### 10.3 Possibility of hazardous reactions

Risk of explosion with:

fuming sulfuric acid, Nitric acid, silver, perchlorates, nitrogen dioxide, nonmetallic halides, acetic acid, halogen-halogen compounds, uranium hexafluoride, organic nitro compounds

Violent reactions possible with:

Strong acids, Strong oxidizing agents

sulfur, with, Heat

### 10.4 Conditions to avoid

Warming.

### 10.5 Incompatible materials

rubber, various plastics

### 10.6 Hazardous decomposition products

no information available

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## SECTION 11. Toxicological information

### 11.1 Information on toxicological effects

#### *Acute oral toxicity*

LD50 Rat: 5.580 mg/kg

Tested according to Directive 92/69/EEC.

Symptoms: Nausea, Vomiting

#### *Acute inhalation toxicity*

LC50 Rat: 25,7 mg/l; 4 h ; vapour

OECD Test Guideline 403

Symptoms: Irritation symptoms in the respiratory tract.

absorption

#### *Acute dermal toxicity*

LD50 Rabbit: 12.124 mg/kg

(ECHA)

absorption

#### *Skin irritation*

Rabbit

Result: irritating

(ECHA)

Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Causes skin irritation.

#### *Eye irritation*

Rabbit

Result: No eye irritation

(ECHA)

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## *Sensitisation*

This information is not available.

## *Germ cell mutagenicity*

### *Genotoxicity in vivo*

Chromosome aberration test

Rat

i.p.

Bone marrow

Result: negative

(ECHA)

### *Genotoxicity in vitro*

In vitro mammalian cell gene mutation test

Mouse lymphoma test

Result: negative

Method: OECD Test Guideline 476

Ames test

Result: negative

(Lit.)

## *Carcinogenicity*

This information is not available.

## *Reproductive toxicity*

This information is not available.

## *Teratogenicity*

This information is not available.

## *CMR effects*

Teratogenicity:

Suspected of damaging the unborn child.

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## *Specific target organ toxicity - single exposure*

May cause drowsiness or dizziness.

Target Organs: Central nervous system

## *Specific target organ toxicity - repeated exposure*

May cause damage to organs through prolonged or repeated exposure.

Target Organs: Central nervous system

## *Aspiration hazard*

Aspiration hazard, Aspiration may cause pulmonary oedema and pneumonitis.

## 11.2 Further information

Systemic effects:

After absorption of large quantities:

Headache, Vomiting, Nausea, Dizziness, CNS disorders, inebriation, Convulsions, Circulatory collapse, respiratory paralysis, respiratory arrest, Unconsciousness, death

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

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## SECTION 12. Ecological information

### 12.1 Toxicity

#### *Toxicity to fish*

LC50 *Oncorhynchus mykiss* (rainbow trout): 5,8 mg/l; 96 h

(ECOTOX Database)

#### *Toxicity to daphnia and other aquatic invertebrates*

EC50 *Daphnia magna* (Water flea): 6 mg/l; 48 h

(ECOTOX Database)

NOEC *E.sulcatum*: 456 mg/l; 72 h

(IUCLID)

#### *Toxicity to algae*

IC50 *Pseudokirchneriella subcapitata* (green algae): 12 mg/l; 72 h

(Lit.)

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## *Toxicity to bacteria*

EC50 Photobacterium phosphoreum: 20 mg/l; 30 min

(Lit.)

## **12.2 Persistence and degradability**

### *Biodegradability*

69 - 81 %; 5 d; aerobic

APHA NO. 219

(ECHA)

Readily biodegradable

### *Theoretical oxygen demand (ThOD)*

3.130 mg/g

(Lit.)

## **12.3 Bioaccumulative potential**

### *Partition coefficient: n-octanol/water*

log Pow: 2,65

(experimental)

(IUCLID) Bioaccumulation is not expected.

## **12.4 Mobility in soil**

### *Distribution among environmental compartments*

Adsorption/Soil

log Koc: 2,15

(experimental)

Moderately mobile in soils (Lit.)

## **12.5 Results of PBT and vPvB assessment**

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

## **12.6 Other adverse effects**

### *Henry constant*

683 Pa·m<sup>3</sup>/mol

(Lit.) Distribution preferentially in air.

Discharge into the environment must be avoided.

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## SECTION 13. Disposal considerations

### *Waste treatment methods*

See [www.retrologistik.com](http://www.retrologistik.com) for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

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## SECTION 14. Transport information

### Land transport (ADR/RID)

14.1 UN number	UN 1294
14.2 Proper shipping name	TOLUENE
14.3 Class	3
14.4 Packing group	II
14.5 Environmentally hazardous	--
14.6 Special precautions for user	yes
Tunnel restriction code	D/E

### Inland waterway transport (ADN)

Not relevant

### Air transport (IATA)

14.1 UN number	UN 1294
14.2 Proper shipping name	TOLUENE
14.3 Class	3
14.4 Packing group	II
14.5 Environmentally hazardous	--
14.6 Special precautions for user	no

### Sea transport (IMDG)



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14.1 UN number	UN 1294
14.2 Proper shipping name	TOLUENE
14.3 Class	3
14.4 Packing group	II
14.5 Environmentally hazardous	--
14.6 Special precautions for user	yes
EmS	F-E S-D

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code  
Not relevant

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## SECTION 15. Regulatory information

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

#### *EU regulations*

Major Accident Hazard	SEVESO III
Legislation	FLAMMABLE LIQUIDS P5c Quantity 1: 5.000 t Quantity 2: 50.000 t

Occupational restrictions	Take note of Dir 94/33/EC on the protection of young people at work. Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.
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Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	not regulated
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Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC	not regulated
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Substances of very high concern (SVHC)

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  $\geq 0.1\%$  (w/w).

*National legislation*

Storage class 3

## 15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

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## SECTION 16. Other information

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

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.

### Training advice

Provide adequate information, instruction and training for operators.

### Labelling

*Hazard pictograms*



*Signal word*

Danger

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## *Hazard statements*

H225 Highly flammable liquid and vapour.

H304 May be fatal if swallowed and enters airways.

H315 Causes skin irritation.

H336 May cause drowsiness or dizziness.

H361 Suspected of damaging fertility or the unborn child.

H373 May cause damage to organs (Central nervous system) through prolonged or repeated exposure.

## *Precautionary statements*

### Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P240 Ground/bond container and receiving equipment.

### Response

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P314 Get medical advice/ attention if you feel unwell.

### Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

## EC Label

## Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at [www.wikipedia.org](http://www.wikipedia.org).

## Regional representation

This information is given on the authorised Safety Data Sheet for your country.

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*The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.*