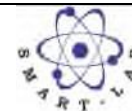


MATERIAL SAFETY DATA SHEET

According to regulation (EU) no.1907/2006

**TOLUENE**

Revision : 02

Date: December 16th, 2021

MSDS Number : 251

Section 1 - Chemical Product and Company Identification

- 1.1 Product Name** : **TOLUENE**
Synonyms : Toluol, Methylbenzene, Methylbenzol, Phenylmethane, Methacide.
CAS No. : 108-88-3
HS Code : 2902 30 00
Chemical Formula : C₇H₈
Molecular Weight : 92.14 g/mol
Product Code : A-1075
Brand : SMART-LAB
- 1.2 Manufacturer** : **PT.Smart-Lab Indonesia**
Address : Ruko Boulevard Taman Tekno Blok E No. 9-11, BSD Serpong, Tangerang - Indonesia
Website : www.smartlabid.com
Email : sales@smartlabid.com
For information : Telp: +62 21- 7588 0205(Hunting) , fax:+62-21-7588 0198
Emergency Telephone: +62-21-7588 0205(Hunting)
- 1.3 Application** : General Chemical reagent

Section 2 - Hazards Identification

2.1 Classification of the substance or mixture**Classification according to Regulation (EC) No 1272/2008**

Flammable liquids (Category 2), H225

Skin irritation (Category 2), H315

Reproductive toxicity (Category 2), H361d

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

Specific target organ toxicity - repeated exposure (Category 2), H373

Aspiration hazard (Category 1), H304

Long-term (chronic) aquatic hazard (Category 3), H412

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

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal word

danger

Hazard statement(s)

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.

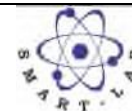
H361d

Suspected of damaging the unborn child.

H373

May cause damage to organs through prolonged or repeated exposure.

MATERIAL SAFETY DATA SHEET
According to regulation (EU) no.1907/2006

**TOLUENE**

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| | |
|--------------------------------|--|
| H412 | Harmful to aquatic life with long lasting effects. |
| Precautionary statement(s) | |
| P201 | Obtain special instructions before use. |
| P210 | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. |
| P273 | Avoid release to the environment. |
| P301 + P310 + P331 | IF SWALLOWED: Immediately call a POISON CENTER/doctor. Do NOT induce vomiting. |
| P302 + P352 | IF ON SKIN: Wash with plenty of water. |
| P308 + P313 | IF exposed or concerned: Get medical advice/ attention. |
| Supplemental Hazard Statements | none |

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Section 3 - Composition, Information on Ingredients

3.1 Substances

| | |
|------------------|---------------------------------|
| Synonyms | : methylbenzene |
| Formula | : C ₇ H ₈ |
| Molecular weight | : 92.14 g/mol |
| CAS-No. | : 108-88-3 |
| EC-No. | : 203-625-9 |
| No. Index | : 601-021-00-3 |

3.2 Mixture**Hazardous ingredients according to Regulation (EC) No 1272/2008**

| Component | Classification | Concentration |
|---|---|---------------|
| Toluene CAS-No. 108-88-3 EC-No. 203-625-9 Index-No. 601-021-00-3 01- | Flam. Liq. 2; Skin Irrit. 2; Repr. 2; STOT SE 3; STOT RE 2; Asp. Tox. 1; H225, H315, H361d, H336, H373, H304 | <=100 % |

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

Section 4 - First Aid Measures

4.1 Description of first aid measures**General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

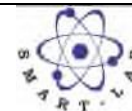
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

MATERIAL SAFETY DATA SHEET

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If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

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**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media

Do NOT use water jet.

5.2 Special hazards arising from the substance or mixture

Carbon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

Use water spray to cool unopened containers

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

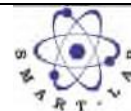
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections

For disposal see section 13.

Section 7 - Handling and Storage

| | | |
|---|--|-------------------|
| <u>MATERIAL SAFETY DATA SHEET</u> | | |
| According to regulation (EU) no.1907/2006 | | |
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**7.1 Precautions for safe handling****Advice on safe handling**

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.

Advice on protection against fire and explosion

Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities**Storage conditions**

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store in cool place.

Storage class Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)

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

Section 8 - Exposure Controls, Personal Protection

8.1 Control parameters**Derived No Effect Level (DNEL)**

| Application Area | Exposure routes | Health effect | Value |
|------------------|-----------------|----------------------------|------------------------|
| Workers | Inhalation | Acute systemic effects | 384 mg/m ³ |
| Workers | Inhalation | Acute local effects | 384 mg/m ³ |
| Workers | Skin contact | Long-term systemic effects | 384mg/kg BW/d |
| Workers | Inhalation | Long-term systemic effects | 192 mg/m ³ |
| Workers | Inhalation | Long-term local effects | 192 mg/m ³ |
| Consumers | Inhalation | Acute systemic effects | 226 mg/m ³ |
| Consumers | Inhalation | Acute local effects | 226 mg/m ³ |
| Consumers | Skin contact | Long-term systemic effects | 226mg/kg BW/d |
| Consumers | Inhalation | Long-term systemic effects | 56.5 mg/m ³ |
| Consumers | Ingestion | Long-term systemic effects | 8.13mg/kg BW/d |

Predicted No Effect Concentration (PNEC)

| Compartment | Value |
|-----------------|-------------|
| Soil | 2.89 mg/kg |
| Marine water | 0.68 mg/l |
| Fresh water | 0.68 mg/l |
| Marine sediment | 16.39 mg/kg |

| | |
|------------------------------|-------------|
| Fresh water sediment | 16.39 mg/kg |
| Sewage treatment plant | 13.61 mg/l |
| Aquatic intermittent release | 0.68 mg/l |

8.2 Exposure controls

Appropriat engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Full contact

Material: Fluorinated rubber
 Minimum layer thickness: 0,7 mm
 Break through time: 480 min
 Material tested: Vitoject®

Splash contact

Material: Fluorinated rubber
 Minimum layer thickness: 0,7 mm
 Break through time: 480 min
 Material tested: Vitoject®

Body Protection

Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

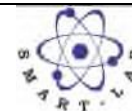
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Section 9 - Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

| | |
|---|------------------------------------|
| Appearance | Form: liquid Colour: colourless |
| Odour | benzene-like |
| Odour Threshold | No data available |
| pH | Not applicable |
| Melting point/freezingpoint | Melting point/range: -93 °C |
| Initial boiling point and boiling range | 110 - 111 °C |
| Flash point | 4.0 °C - closed cup |

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|--|--|
| Evaporation rate | No data available |
| Flammability (solid, gas) | No data available |
| Upper/lower flammability or explosive limits | Upper explosion limit: 7.1 %(V) Lower explosion limit: 1.2 %(V) |
| Vapour pressure | 30,88 hPa at 21,1 °C |
| Vapour density | 3,18 |
| Relative density | 0,865 g/mL at 25 °C |
| Water solubility | 0,58 g/l at 25 °C - partly soluble |
| Partition coefficient: noctanol/water | log Pow: 2,73 at 20 °C - Bioaccumulation is not expected. |
| Auto-ignition temperature | 535,0 °C |
| Decomposition temperature | No data available |
| Viscosity | No data available |
| Explosive properties | No data available |
| Oxidizing properties | No data available |

9.2 Other safety information

| | |
|------------------------|----------------------------------|
| Conductivity | < 0,01 µS/cm |
| Surface tension | 27,73 mN/m at 0,516 g/l at 25 °C |
| Relative vapor density | 3,18 |

Section 10 - Stability and Reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

In the event of fire: see section 5

Section 11 - Toxicological Information

11.1 Information on toxicological effects**Acute toxicity**

LD50 Oral - Rat - male - 5.580 mg/kg (Tested according to Directive 92/69/EEC.)

LC50 Inhalation - Rat - male and female - 4 h - 25,7 mg/l (OECD Test Guideline 403)

LD50 Dermal - Rabbit - > 5.000 mg/kg

Remarks: (ECHA)

Skin corrosion/irritation

Skin - Rabbit

| | | |
|---|--|---|
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Result: irritating - 4 h
Remarks: (ECHA)

Serious eye damage/eye irritation

Eyes - Rabbit
Result: slight irritation (OECD Test Guideline 405)

Respiratory or skin sensitisation

Maximization Test - Guinea pig
Result: negative (Regulation (EC) No. 440/2008, Annex, B.6)

Germ cell mutagenicity

Test Type: In vitro mammalian cell gene mutation test
Test system: Mouse lymphoma test
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: Ames test
Test system: S. typhimurium
Metabolic activation: with and without metabolic activation
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)
Result: negative Test Type: Chromosome aberration test Species: Rat Cell type: Bone marrow Application
Route: i.p.
Result: negative
Remarks: (ECHA)

Carcinogenicity

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Toluene)

Reproductive toxicity

Suspected of damaging the unborn child.

Specific target organ toxicity - single exposure

May cause drowsiness or dizziness. - Central nervous system

Specific target organ toxicity - repeated exposure

May cause damage to organs through prolonged or repeated exposure. –
Central nervous system

Aspiration hazard

Aspiration hazard, Aspiration may cause pulmonary edema and pneumonitis.

Additional Information

RTECS: XS5250000

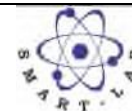
Drowsiness, irritant effects, Dizziness, Convulsions, Headache, Nausea, Vomiting, Circulatory collapse, somnolence, inebriation, Unconsciousness, respiratory arrest, CNS disorders, respiratory paralysis, death
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section 12 - Ecological Information

12.1 Toxicity

Toxicity to fish
Toxicity to fish flow-through test

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LC50 - Oncorhynchus kisutch (coho salmon) - 5,5 mg/l - 96 h
Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates
EC50 - Ceriodaphnia dubia (water flea) - 3,78 mg/l - 48 h (US-EPA)
Toxicity to bacteria
static test EC50 - Bacteria - 84 mg/l - 24 h Remarks: (ECHA)

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 20 d
Result: 86 % - Readily biodegradable.
Remarks: (IUCLID).

12.3 Bioaccumulative potential

Bioaccumulation Leuciscus idus (Golden orfe) - 3 d - 0,05 mg/l(Toluene)
Bioconcentration factor (BCF): 90

12.4 Mobility in soil

No data available(Toluene)

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Toxic to aquatic life.

Section 13 – Disposal Considerations

13.1 Waste treatment methods**Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Waste material must be disposed of in accordance with the Directive on waste 2008/98/EC as well as other national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

Contaminated packaging

Dispose of as unused product.

Section 14 – Transport Information

14.1 UN number

ADR/RID: 1294

IMDG: 1294

IATA: 1294

14.2 UN proper shipping name

ADR/RID: TOLUENE

IMDG: TOLUENE

IATA: Toluene

14.3 Transport hazard class(es)

ADR/RID: 3

IMDG: 3

IATA: 3

14.4 Packaging group

ADR/RID: II

IMDG: II

IATA: II

14.5 Environmental hazards

| | | |
|---|--|-------------------|
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ADR/RID: no

IMDG Marine pollutant: no

IATA: no

14.6 Special precautions for user

No data available

Section 15 - Regulatory Information

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

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out

Section 16 - Additional Information

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

| | |
|-------|--|
| H225 | Highly flammable liquid and vapor. |
| 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. |
| H412 | Harmful to aquatic life with long lasting effects. |

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Revision history :

| Date | Rev | Description |
|-----------|-----|-------------------|
| 16 may 17 | 01 | - |
| 3 Nov 21 | 02 | thorough revision |

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. PT. Smartlab Indonesia shall not be held liable for any damage resulting from handling or from contact with the above product.