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

1.1 Product identifiers
Product name : Tert-Butyl hydroperoxide solution 70 wt. % in H2O
Product Number : 458139
Brand : Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet
Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO  63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone
Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 3), H226
Organic peroxides (Type F), H242
Acute toxicity, Oral (Category 4), H302
Acute toxicity, Inhalation (Category 2), H330
Acute toxicity, Dermal (Category 3), H311
Skin corrosion (Category 1C), H314
Serious eye damage (Category 1), H318
Skin sensitization (Category 1), H317
Germ cell mutagenicity (Category 2), H341
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Short-term (acute) aquatic hazard (Category 2), H401
Long-term (chronic) aquatic hazard (Category 2), H411
For the full text of the H-Statements mentioned in this Section, see Section 16.

### 2.2 GHS Label elements, including precautionary statements

**Pictogram**

<table>
<thead>
<tr>
<th>Pictogram</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Pictogram]</td>
</tr>
</tbody>
</table>

**Signal Word**

Danger

**Hazard statement(s)**

- **H226**: Flammable liquid and vapor.
- **H242**: Heating may cause a fire.
- **H302**: Harmful if swallowed.
- **H311**: Toxic in contact with skin.
- **H314**: Causes severe skin burns and eye damage.
- **H317**: May cause an allergic skin reaction.
- **H330**: Fatal if inhaled.
- **H335**: May cause respiratory irritation.
- **H341**: Suspected of causing genetic defects.
- **H411**: Toxic to aquatic life with long lasting effects.

**Precautionary statement(s)**

- **P201**: Obtain special instructions before use.
- **P202**: Do not handle until all safety precautions have been read and understood.
- **P210**: Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
- **P220**: Keep/Store away from clothing/ combustible materials.
- **P233**: Keep container tightly closed.
- **P234**: Keep only in original container.
- **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.
- **P260**: Do not breathe mist or vapors.
- **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 must not be allowed out of the workplace.
- **P273**: Avoid release to the environment.
- **P280**: Wear protective gloves/ protective clothing/ eye protection/ face protection.
- **P284**: Wear respiratory protection.
- **P301 + P312 + P330**: IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
- **P301 + P330 + P331**: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- **P303 + P361 + P353**: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- **P304 + P340 + P310**: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
- **P305 + P351 + P338 + P310**: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
- **P308 + P313**: IF exposed or concerned: Get medical advice/ attention.
- **P333 + P313**: If skin irritation or rash occurs: Get medical advice/ attention.
- **P362**: Take off contaminated clothing and wash before reuse.
P370 + P378  
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

P391  
Collect spillage.

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.

P410  
Protect from sunlight.

P420  
Store away from other materials.

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

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Synonyms: TBHP

Molecular weight: 90.12 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>tert-Butyl hydroperoxide</td>
<td>Flam. Liq. 3; Org. Perox. A; Acute Tox. 4; Acute Tox. 2; Acute Tox. 3; Skin Corr. 1C; Eye Dam. 1; Skin Sens. 1; Muta. 2; STOT SE 3; Aquatic Acute 2; Aquatic Chronic 2; H226, H240, H302, H330, H311, H314, H318, H317, H341, H335, H401, H411</td>
<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>75-91-2</td>
<td></td>
</tr>
<tr>
<td>EC-No.</td>
<td>200-915-7</td>
<td></td>
</tr>
<tr>
<td>Index-No.</td>
<td>617-023-00-2</td>
<td></td>
</tr>
</tbody>
</table>

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
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

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

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.
If swallowed
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

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
Water Foam Carbon dioxide (CO2) 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
Carbon oxides
Mixture with combustible ingredients.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air at elevated temperatures.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice 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.

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

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, 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. For personal protection see section 8.

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
For disposal see section 13.
SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
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. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Keep locked up or in an area accessible only to qualified or authorized persons. Separately or together with other organic peroxides only and away from sources of ignition and heat.

Storage stability
Recommended storage temperature
2 - 8 °C

Storage class
Storage class (TRGS 510): 5.2: Organic peroxides and self-reacting hazardous materials

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

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>tert-Butyl hydroperoxide</td>
<td>75-91-2</td>
<td>TWA</td>
<td>0.1 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td></td>
<td></td>
<td>Danger of cutaneous absorption</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

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

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles
**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.

**Full contact**
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested: Camatril® (KCL 730 / Aldrich Z677442, Size M)

**Splash contact**
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 60 min
Material tested: Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**
Flame retardant antistatic protective clothing.

**Respiratory protection**
required when vapours/aerosols are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

**Control of environmental exposure**
Do not let product enter drains. Risk of explosion.

---

**SECTION 9: Physical and chemical properties**

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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Form: clear, liquid</td>
</tr>
<tr>
<td></td>
<td>Color: colorless, light yellow</td>
</tr>
<tr>
<td>Odor</td>
<td>No data available</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>4.3</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>Melting point/range: -3 °C (27 °F) at 1,013 hPa</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>96.2 °C 205.2 °F at 1,013 hPa</td>
</tr>
<tr>
<td>Flash point</td>
<td>42 °C (108 °F) - closed cup</td>
</tr>
</tbody>
</table>
h) Evaporation rate No data available
i) Flammability (solid, gas) No data available
j) Upper/lower flammability or explosive limits
   Upper explosion limit: 10.15 % (V)
   Lower explosion limit: 5.75 % (V)
k) Vapor pressure 30.73 hPa at 20 °C (68 °F)
l) Vapor density No data available
m) Density 0.93 g/mL at 25 °C (77 °F)
   Relative density No data available
n) Water solubility soluble
o) Partition coefficient: n-octanol/water No data available
p) Autoignition temperature No data available
q) Decomposition temperature No data available
r) Viscosity No data available
s) Explosive properties Not classified as explosive.
t) Oxidizing properties none

9.2 Other safety information
   No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
   Vapor/air-mixtures are explosive at intense warming.

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

10.3 Possibility of hazardous reactions
   No data available

10.4 Conditions to avoid
   Heating.

10.5 Incompatible materials
   Powdered metals, Organic 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

**Mixture**

**Acute toxicity**
Oral: No data available

Inhalation: No data available
Acute toxicity estimate Inhalation - 4 h - 1.2 mg/l - vapor (Calculation method)
Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract
Dermal: No data available
Acute toxicity estimate Dermal - 628.57 mg/kg (Calculation method)
No data available

**Skin corrosion/irritation**
No data available
Mixture causes burns.

**Serious eye damage/eye irritation**
No data available
Mixture causes serious eye damage. Risk of blindness!

**Respiratory or skin sensitization**
Mixture may cause an allergic skin reaction.

**Germ cell mutagenicity**
No data available
Evidence of genetic defects.

**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.
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

**Reproductive toxicity**
No data available
No data available

**Specific target organ toxicity - single exposure**
Remarks: No data available
Mixture may cause respiratory irritation.

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available
11.2 Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea
Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Handle in accordance with good industrial hygiene and safety practice.

Components

tert-Butyl hydroperoxide

Acute toxicity
LD50 Oral - Rat - male and female - 560 mg/kg
Remarks: Aqueous solution
(ECCHA)
LC50 Inhalation - Rat - male and female - 4 h - 0.84 mg/l - vapor
(OECD Test Guideline 403)
LD50 Dermal - Rabbit - male and female - 440 mg/kg
(OECD Test Guideline 402)
Remarks: Aqueous solution
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Corrosive, category 1C - where responses occur after exposures between 1 hour and 4 hours and observations up to 14 days. - 24 h
Remarks: Aqueous solution

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Corrosive - 21 d
Remarks: Aqueous solution

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: positive
(OECD Test Guideline 406)
Remarks: Aqueous solution

Germ cell mutagenicity
Suspected of causing genetic defects.
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: Chinese hamster cells
Result: positive
Remarks: (in analogy to similar products)
Test Type: In vitro mammalian cell gene mutation test
Test system: Mouse lymphoma test
Result: positive
Remarks: (in analogy to similar products)
Test Type: Ames test
Test system: S. typhimurium
Result: positive
Remarks: (in analogy to similar products)
Species: Mouse - male and female
Result: negative
Remarks: (in analogy to similar products)
Species: Mouse - male
Result: positive
Remarks: (in analogy to similar products)
Species: Rat - male
Result: negative
Remarks: (in analogy to similar products)

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

Aspiration hazard
No data available

SECTION 12: Ecological information

12.1 Toxicity
Mixture
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

Components
tert-Butyl hydroperoxide
Toxicity to fish
semi-static test LC50 - Pimephales promelas (fathead minnow) - 29.61 mg/l - 96 h
(OECD Test Guideline 203)
Remarks: Aqueous solution

Toxicity to daphnia and other aquatic invertebrates
static test EC50 - Daphnia magna (Water flea) - 14.1 mg/l - 48 h
(OECD Test Guideline 202)
Remarks: Aqueous solution

Toxicity to algae
static test ErC50 - Pseudokirchneriella subcapitata - 1.5 mg/l - 72 h
(OECD Test Guideline 201)
Remarks: Aqueous solution

Toxicity to bacteria
Growth inhibition EC50 - activated sludge - 17 mg/l - 30 h
(OECD Test Guideline 209)
Remarks: Aqueous solution

SECTION 13: Disposal considerations

13.1 Waste treatment methods

**Product**
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

**DOT (US)**
UN number: 3109   Class: 5.2 (8)
Proper shipping name: Organic peroxide type F, liquid (tert-Butyl hydroperoxide, ≤72%)
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

**IMDG**
UN number: 3109   Class: 5.2 (8)   EMS-No: F-J, S-R
Proper shipping name: ORGANIC PEROXIDE TYPE F, LIQUID (tert-BUTYL HYDROPEROXIDE)

**IATA**
UN number: 3109   Class: 5.2 (8, HEAT)
Proper shipping name: Organic peroxide type F, liquid (tert-Butyl hydroperoxide)
Special Provisions: "Keep away from heat" label required.

SECTION 15: Regulatory information
SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
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.

SARA 311/312 Hazards
Fire Hazard, Reactivity Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

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. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Copyright 2020 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 6.13 Revision Date: 09/08/2022 Print Date: 11/11/2023